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# POISON IVY DERMATITIS: THE FIRST SOUTH AFRICAN CASES*

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This is the story of a mistake in diagnosis, in fact of many mistakes. It begins in 1956 and has, I hope, now ended. Within these 3 years it has led to the appearance of not less than 8 cases of a self-limited but severe dermatitis. In the first 6 instances this was recognized only as an unusual external contact reaction; the cause was not determined. By good fortune, case 7—Mrs. A.P.—recalled clearly that her symptoms began after she had helped her husband to cut down their garden hedge. She stated further that her 3 children and her husband had, in the past, been similarly affected. The hedge contained hawthorn, youngberry, and an ivy creeper. She was patch-tested to the leaves of all three and gave a positive reaction to the last. Despite the fact that poison ivy had never before been recognized in the Union, my suspicions were aroused, and I sent the specimen, accompanied by a note suggesting its possible nature, to the Division of Botany of the Department of Agriculture. Their answer dispelled any doubts I might have entertained. Case 8 occurred in the young Native boy who was given the job of destroying and removing the remainder of the hedge.

Poison ivy (*Rhus radicans* Linn.) is a member of the anacardiaceae or cashew family. It is described by Meunscher[1] as a woody stemmed erect shrub or vine, climbing by aerial rootlets on fences, walls or trees. It has slender creeping rootstocks which arise from its basal stem nodes and may run horizontally underground for several yards, sending up short leafy shoots from its nodes. Its leaves are alternate and compound with 3 leaflets. The leaflets are glossy or dull green and glabrous or somewhat hairy, with margins entire, toothed or somewhat lobed (Fig. 1). The flowers are polygamous in slender, open, axillary panicles. The calyx is 5-lobed and there is a corolla of 5 yellow-green petals, 5 separate stamens, a solitary pistil, and a 1-celled ovary. The fruit is a small white or cream-coloured, almost dry, nearly globular drupe, about 4-6 mm. in diameter, with a greyish striped 1-seeded stone about 3-4 mm. in diameter.

The plant is widespread throughout the USA and Southern Canada, where it is found in dry rocky fields, pastures, fence rows, banks, waste places and rich alluvial woodlands. It appears to have been introduced into Olifantsfontein, where the cases occurred, about the year 1950, but it has not been possible to discover precisely whence it came, for the several families who in turn occupied the house where the original plant grows have now moved away and many of their members have died. It says much for the hardiness of the plant that the original cutting took and still flourishes. Fig. 2 shows its precarious foothold in a tiny opening cut in the concrete of a south-facing stoep. From there it was passed as slips to at least 4 of the gardens in the neighbourhood, in 3 of which it luxuriates. As far as I know, it has not yet found its way elsewhere, but gardeners are generous people and cuttings from so strongly growing a plant may easily have been given to others and for the moment have been forgotten. Natural spread may also have taken place.

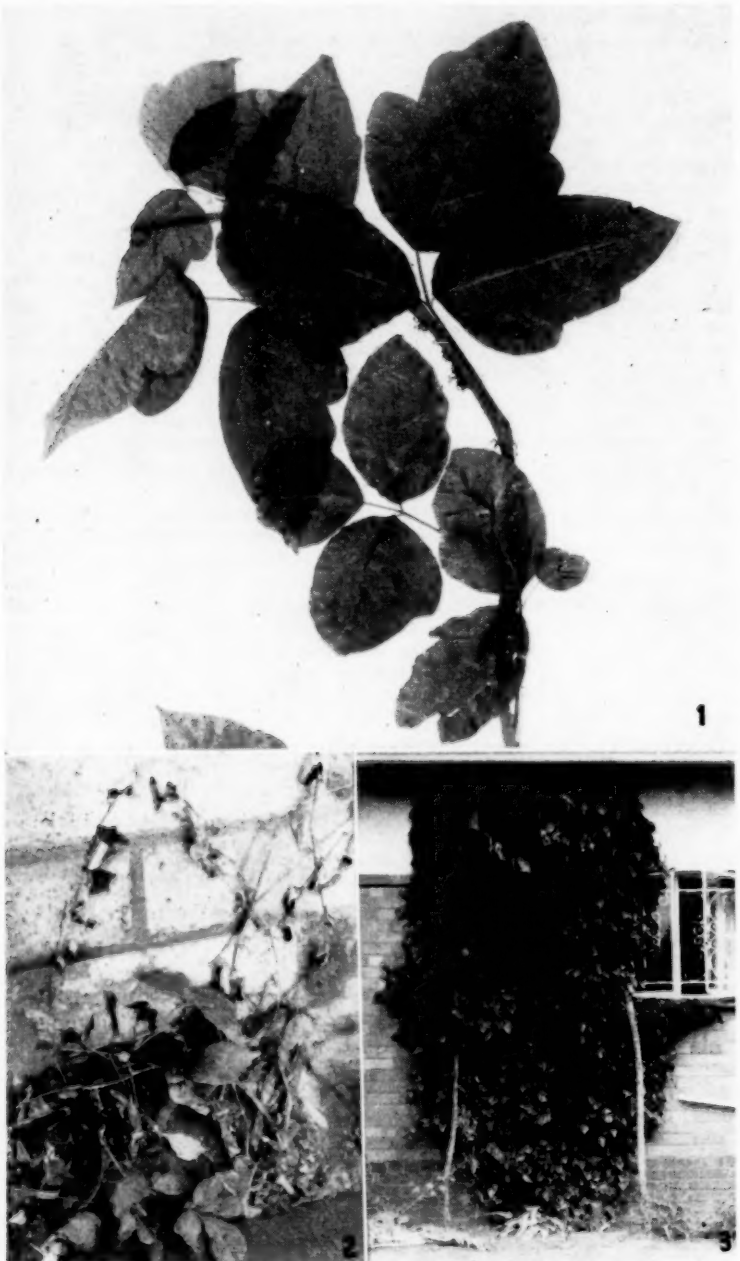
The initial attack of ivy dermatitis (Sutton *et al.*[2]), which sensitizes, differs from subsequent attacks occurring after sensitization. The first outbreak is likely to manifest itself as a crusted exudative painful lesion from primary irritation—a lesion, sterile on culture, which resists all kinds of treatment and remains practically unchanged for several days. Once sensitization has developed, swelling and vesiculation make their appearance at distant sites where relatively low concentrations of antigen have reached the skin—concentrations too low to serve as primary irritants, but ample to evoke a reaction when an allergic state exists.

In subsequent attacks, the symptoms begin typically upon the backs of the fingers, in the interdigital spaces and on the eyelids, although they may begin on the ankles or other parts which have been exposed through thin clothing. The lesions are vesicular, usually grouped, and often linear. The eyelids are puffy, being worse in the morning and better in the evening, when the swelling is dissipated by the movement of the facial muscles. The dermatitis is transmitted to other parts, especially the forearms and the male genitals, which become greatly swollen. Although on occasion incubation periods ranging from 6 hours to 12 days have been reported, a period of about 36 hours usually elapses from the time of exposure until the onset of symptoms, and from then they develop to reach a maximum in 5 days. Then a more or less abrupt crisis takes place in the uncomplicated case and the patient, miserable as he has been, knows that he is making a change for the better. Roughly 3 weeks more are then required for the skin to revert to normal, but this healing time is naturally dependent on the intensity of the dermatitis and upon the degree of sensitivity.

The cases seen here have scarcely been so dramatic. The first, V.C. aged 8, came to me in September 1956. He then had no lesions whatever, but his mother stated that during the the preceding 2 months he had had several transient attacks of swelling of his ears, lips and eyes which had subsided in 4 or 5 days. This child is a keen cricketer, and it is now obvious that he developed his symptoms through poking his head into the plant growing in his garden (Fig. 3) when looking for his cricket ball. T.P., aged 13, and A.P., aged 11, who were seen by Dr. Findlay in January 1957, live across the road from him and frequently joined with him in games.

* A paper read at the National Meeting of the Dermatological Group (M.A.S.A.) on 29 March, 1959.

When Dr. Findlay examined them, he found T.P. to have an acute swelling and eczema of the face, with a punctate urticarial rash associated with scratch marks on the arms, and a punctate morbilliform rash on the neck and upper chest. A.P. showed a scratch on the left side of the face with oedema and eczema in the surrounding area. Their father, Mr. P., had a haemorrhagic rash on his arms, and it is likely that he had again been busy on his hedge. Their sister A.M.P., aged 5, became a patient of mine in October 1957, when she had a diffuse erythema and swelling of the right cheek which made me think of erysipelas; 6 days later it had cleared from the face to leave some crusting around the nostrils and on the cheek, but had produced papulo-vesicles on the palms and wrists and eczematoid patches on the chest. The 6th case, Mrs. D., aged 50, sought advice in January 1958 for erythematous patches studded with scratched papules which were situated on her left cheek, in front of her left ear and on the right of her nose. When I examined case 7, Mrs. A.P., aged 49, the patient whose history led to the unravelling of the mystery, she had what I thought to be a non-specific contact reaction on her buttocks, upper thighs and natal cleft. The areas were red and there was some scaling and papulation but, as exposure had taken place 2 weeks earlier, her symptoms were obviously subsiding. Curiously enough she had not handled the plant but had brought a cup of tea to her husband who was working on their hedge; and after lifting her frock had sat down on the cut foliage; hence the peculiar distribution.



*Figs.* 1, 2 *and* 3. Poison ivy (*Rhus radicans*).

It is this odd distribution which calls to mind the case reports of the trouble which has befallen sensitized Americans abroad who have developed dermatitis in countries where poison ivy itself is unknown through contact with other dermatitis - producing anacardiaceae. Cases have been described of their soldiers getting dermatitis of the buttocks in Japan through sitting on toilet seats finished in Japanese lacquer derived from *Rhus verniciflua*, and in the tropics of rashes on other parts of the body from laundry marked with juices of the *Samecarpus anacardium*, or Indian ink tree. (When this tree is cut a milky sap exudes, which darkens and is then used in the manufacture of these marking substances.) In our country they would obviously be most likely to come into contact with mangoes, *Mangifera indica*, or with the products of the cashew-nut tree, *Anacardium occidentale*. In the new edition of his book on the Medicinal and Poisonous plants of Southern Africa, which is soon to be published, Professor Watt[3] states that although the seed kernel of the cashew-nut is edible it is actually poisonous unless roasted till all the pericarp oil has exuded. The fumes which come off during this process are exceedingly irritant. The oily juice is dark brown or almost black in colour and is acrid and irritant to the skin, causing swelling, vesiculation and even

acute dermatitis. The husk or shell likewise produces a contact dermatitis. The tar from the bark is vesicant and the brown oily juice which exudes on warming a fresh surface of the nut is used as a topical irritant by African herbalists. In Tanganyika, the juice is used for making scars, keloids and tribal marks. In Europe, dock workers have developed 'vanilla itch' due to the fact that cardole, extracted from the juice, is painted on the pods to give them a bright brown shiny appearance.

The Pretoria Botanical Garden contains several specimens of *Heeria argentea* (Thunb.) Meisn., an indigenous shrub-like member of the anacardiaceae which has been reported as causing severe dermatitis amongst Natives in Pondoland. However, the curator tells me that, though he usually mentions this effect to visitors and though many people have handled the plant, no reaction to it has yet occurred.

The fact that the American population, as estimated by random samples, is sensitized to an extent of over 50% to poison ivy makes it not unlikely that in the near future one of the many visitors we have from America will come into contact with one of these related irritants, and will develop a cross sensitization. Fortunately, cross reactions are weaker and can normally only be elicited in those whose primary sensitivity is extreme. If it were not so, even calamine lotion, through its phenol content, could conceivably be hazardous for the poison-ivy sensitive person and could act as a secondary allergen.

### DESENSITIZATION AND TREATMENT

In the following section I have freely borrowed from Kligman's excellent article.[4]

The antigenic composition of the related irritant species is precisely known and, expressed in general terms, all the antigens are phenols, catechols or resorcinols, with a 15-carbon-atom chain, usually unsaturated, in a position meta to one of the hydroxyl radicals. The saturated component (hydro-urushiol) illustrates the general structure (Fig. 4). The position of the carbon atom is important and dihydric phenols such as adrenaline and dihydroxyphenylalanine which occur in the body and which have the atom in the 4 position do not produce cross reactions.

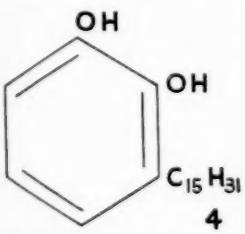



*Fig.* 4. Hydro-urushiol (3-pentadecyl catechol).

The plant allergens are contained in the sap, which is distributed to the roots, stems, leaves and fruit by resin canals. The canals do not connect with the surface and it is necessary[5] for contact to be made with a bruised leaf before dermatitis will follow. Uninjured leaves are completely innocuous. Sensitization occurs easily and from casual contact with the plants. Mere traces of allergen are sufficient and it is probably unwise to assume resistance to sensitization in anyone. Fortunately, a spontaneous decline in sensitivity occurs with increasing age, and fresh antigenic stimulations of a moderate kind through further contact with the ivy do not ordinarily revive a waning or lost sensitivity, nor do they act as booster doses. Relative refractoriness to further exposure following a severe attack, though reported, is uncommon. The prevention, or blocking of the development of, sensitivity has interested may observers. When Chase[6] and Sulzberger[7] inhibited the development of sensitization in guinea-pigs to 2, 4-dinitrochlorobenzene and arsphenamine by prior feeding and intracardiac injection, respectively, it was hoped that this phenomenon would be applicable to poison ivy. Kligman, however, was unable to produce any degree of blocking by giving pentadecylcatechol either orally or intramuscularly to mentally defective children, previously unexposed, before exposing them to surface contact with crushed leaves. He stresses, however, that his studies in this important aspect of the problem have not gone far, and further investigation will be required into the question of total dosage, spacing of doses, absorption of antigen, route of administration, etc. When testing for sensitivity, delayed reactions should not be overlooked; Shelmire[8] has said they may occur even up to 11 days after the test. In sensitized persons, when high concentrations of pentadecylcatechol are introduced into the mouth a severe stomatitis follows and, when given in capsules, a pruritus ani. When injected intramuscularly there may be fever, malaise and other constitutional symptoms, and therefore Kligman proposes that there is biologically a state of generalized or systemic allergy, though under the usual clinical circumstances the potential of other tissues to react does not become manifest. In exceptional cases, however, reactions have been reported such as leucocytosis, eosinophilia, tissue eosinophilia, glomerulonephritis (presumably due to secondary bacterial infection of the widespread dermatitis), id reactions in the shape of erythematous, macular and papular rashes (compare the case T.P.), palmar dyshidrosis, and pigmentary changes.

External prophylaxis, through attempts to remove the allergen within 5 minutes of exposure by washing with soap or with acetone and ether in equal parts, is of little value in highly sensitive persons, though it seems to have some merit in the mildly sensitive if done before 1 hour elapses. Penetration or fixation of the antigen in the skin therefore appears to occur with great rapidity. Water-resisting and oil-resisting barrier creams and petroleum jelly (which was used as a control) offered no practical degree of protection in sensitive subjects against the effects of contact with freshly crushed leaves. Detoxicants and local complexing and chelating compounds were likewise ineffective, probably because of the rapidity with which penetration takes place.

As topical therapy nothing surpasses simple compresses and non-medicated shake lotions and creams. Local steroids, in all the variety of forms now available and regardless of the frequency of application, do not appear to have any moderating effect even when treatment is begun within 10 minutes of the application of the allergen. Parenteral steroids are another matter. Dr. Findlay treated the patient T.P. with ACTH gel, and I felt that one of my cases was rapidly improved with oral meticorten. Kligman strongly advocates the parenteral use of steroids, but dismisses as valueless antihistaminics and all other oral and parenteral medications.

Phylactic treatment by the administration of ivy extracts during the acute phase, which at one time was thought to be valuable,[8, 9] is not only useless but dangerous[10, 11] and when given may produce a systemic reaction comparable to that previously described.

It will thus be seen that this plant, despite its beauty, is the source of a great deal of discomfort and distress. It has worried the Americans for over 300 years and as early as

1610 Captain John Smith,[12] that interesting adventurer, the man for whose life the Indian princess Pocahontas pleaded, reported cases in his men. It is now the commonest cause of allergic contact dermatitis in America. This being so, it is hoped that this paper will lead to the seeking out and destruction of all specimens that have taken root in the Union and will thus contribute, to the prevention of disease here.

SUMMARY

The paper describes what are believed to be the first cases of dermatitis due to contact with poison ivy that have been recognized in the Union.

The nature of the allergen responsible and the treatment of the condition are briefly discussed.

A strong recommendation is made that all specimens of the plant growing in this country should be uprooted and destroyed.

OPSOMMING

Die artikel beskryf wat beskou word as die eerste gevalle van dermatitis, as gevolg van kontak met ‚Poison Ivy', wat in die Unie voorgekom het.

Die aard van die allergeen wat verantwoordelik is, en die behandeling van die toestand word kortliks bespreek.

Dit word ten sterkste aanbeveel dat alle ‚Poison Ivy'-plante in die land vernietig word.

I wish to acknowledge my gratitude to the Division of Botany of the Department of Agriculture, to Prof. D. G. Steyn, of Pretoria, and to Prof. J. M. Watt, of Johannesburg, for advice and assistance in preparing this paper; and to Dr. I. Kopman, of Olifantsfontein, and Dr. G. H. Findlay, of Pretoria, for allowing me to use material relevant to some of the cases.

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## FORTHCOMING INTERNATIONAL MEDICAL CONFERENCES

*The Second World and Fourth European Aviation and Space Medicine Congress* will be held in Rome from 27 to 31 October 1959. During the Congress the following subjects will be discussed: (1) Present methods and data for the psychophysic selection of the flying personnel and provisions for the future, (2) Occupational pathology of flying personnel and maintenance and improvement of its psychophysic efficiency, and (3) Advances in scientific research of space medicine. A proposal will be made for the foundation of a European Aeromedical and Space Medicine Association.

All persons concerned with aviation and space medicine are invited to participate in the Congress and present scientific papers relating to the subjects of the meeting. A summary not exceeding 250 words (English or French) containing the results and conclusions of research must reach the Organizing Committee of Aviation and Space Medicine Congress, 2/A via Piero Gobetti, Rome, before 31 August 1959.

* * *

*International Congress of Gastro-enterology*. This Congress, organized by the Society of Netherlands Gastroenterologists, will be held in Leyden from 20 to 24 April 1960. The Congress programme includes 5 working sessions of a half day each. There will also be a sixth working session specially devoted to questions concerning X-ray technique. There will also be 5 panel discussions on colitis ulcerosa, coma hepaticum, hepatitis and its treatment, morbus Crohn, and diagnosis and treatment of portal hypertension.

The lectures submitted should apply to one of the two main themes of the Congress, namely: Pathology, pathological physiology, clinical aspects of the small intestine; or Hepatatitis, cirrhosis hepatis and their possible connection; or be devoted to a subject of the lecturer's choice in the field of gastro-enterology.

All texts must be typed and submitted in triplicate. Each submission must consist of the complete text (maximum 2,200 words) plus a summary of the text (maximum 200 words, including title and author). Texts should be submitted in English, French, German, Spanish or Dutch, but preferably in English. Each contributor may submit one page of illustrations for the Congress report. All lectures will be published in English, the language of the Congress, and translations will be arranged by the Scientific Committee through the offices of the 'Excerpta Medica Foundation'. Authors of lectures which are accepted will have 10 minutes' speaking time, but there will be opportunity for a certain amount of discussion. During the sixth working session (roentgenology) 30 minutes will be available to each speaker.

Lectures must be submitted together with the official form as soon as possible, but by 1 October 1959 at the latest, to The Secretariat of the International Congress of Gastroenterology, 16 Lange Voorhout, The Hague, The Netherlands.

A limited supply of application forms are available through the Editorial office of this *Journal*.

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*The Fourth International Goitre Conference* will be held at the Royal College of Surgeons, London, on 5-9 July 1960. Abstracts of papers to be considered for presentation should be sent to Dr. Selwyn Taylor, 3 Roedean Crescent, Roehampton, London S.W. 3. Abstracts should be submitted before 1 December 1959 and should not exceed 400 words, and they must be submitted in quintuplicate. Presentation of papers will be limited to 15 minutes, and a copy of the final paper must be sent to the London secretary 2 weeks before the meeting.

* * *

*The Eighth International Congress of Haematology*, organized by the International Society of Haematology and the Science Council of Japan, will be held in Sankei-Kaikan, Tokyo, Japan, on 4-10 September 1960. The main subjects of the scientific sessions will be (1) nucleonics (2) leukaemia (3) haemocytology (4) anaemia (5) coagulation and haemorrhagic disorders, and (6) immunohaematology. The working languages of the Congress will be English, French and Japanese.

Those who wish to present papers at the Congress are requested to inform the Organizing Committee about the subjects of their papers on the official application form and submit abstracts not longer than 400 words, typewritten in English, by 29 February 1960. All communications should be addressed to the Secretary, Organizing Committee, 8th International Congress of Haematology, Science Council of Japan, Ueno Park, Taito-ku, Tokyo, Japan.

We understand that a second circular will be dispatched later and any additional information will be published in this *Journal*. There are, however, a very limited number of the first circular and application forms available through the Editorial office of the *Journal*.

* * *

*The Second International Meeting of Forensic Pathology* will be held in New York, USA, on 18-21 September 1960. During the course of this meeting the new building for the office of the Chief Medical Examiner, City of New York, will be dedicated. For information contact Dr. Milton Helpern, 55 East End Avenue, New York 28, N.Y., USA; Dr. Charles Larsen, Tacoma General Hospital, Tacoma 5, Washington, USA; or Dr. Francis E. Camps, 37 Welbeck Street, London W. 1, UK.

**Suid-Afrikaanse Tydskrif vir Geneeskunde : South African Medical Journal**

VAN DIE REDAKSIE : EDITORIAL

## NAME EN BESKRYWINGS

Mag ons nog pleit vir die behoud van name van persone en plekke in die geneeskundige terminologie, of moet ons poog om beskrywende terme waar moontlik te gebruik? Elkeen mag sy voorkeur gee na eie smaak, maar ons voel tog dat die gebruik van persoonsname toelaatbaar is omdat hulle in baie gevalle korter en geriefliker is as die omskrywende benaming, en ook, en veral omrede van hul historiese waarde.

Die gebruik van ‚Bornholm se siekte' en ‚Coxsackie se virus-infeksie' voer ons gedagtes na veraf lande en herinner ons aan die broederskap van die geneeskunde!

Dikwels word ten onregte 'n naam aan 'n siektebeeld gekoppel—soms selfs om onverstaanbare redes. Ook is dit dikwels nie die eerste beskrywer wat so vereer word nie, bv. von Recklinghausen se neurofibromatose (1882) is reeds in 1793 deur Tilesius beskryf,[1] terwyl Caleb Parry, van Bath, Hirschsprung se siekte herken het nog voor Hirschsprung gebore is, en Graves se siekte beskryf het lank voor Graves dit gedoen het.[2]

Shapiro[3] bespreek die dubbelnaam in die geskiedenis in 'n onlangse artikel. Voor die negentiende eeu was die reuse in die mediese geskiedenis alleenwerkers, bv. Hippokrates, Vesalius, Sydenham, Laennec en Heberden. Hierna het medewerkers begin verskyn met die gevolg dat die geneeskundige terminologie vandag wemel van samestellings soos Weil-Felix, Libman-Sacks, ens.

Daar is die groep wat egter toevallig met 'n dubbeldoorvan geseën is (ons dink bv. aan die Afrikaanse vanne soos de Waal Rossouw, van Wyk Louw). Hieronder val mense soos Riva Rocci, Brown Séquard, Price Jones, Smith Petersen, Parkes Weber en Szent Györgyi, wie se name dus sonder 'n koppelteken gespel moet word. H. Bence Jones het Bence Jones-proteïen beskryf.

Dikwels gebeur dit dat 'n dubbelnaam enkel word, bv. 75 jaar gelede was die Horner-sindroom as die Bernard-Horner-sindroom bekend, aangesien Claude Bernard die letsel eksperimenteel by diere opgewek het, terwyl Horner dit later by mense beskryf het. Dit geld ook vir die Wassermann-reaksie en die Widal-toets wat vroeër respektiewelik Bordet-Wassermann en Gruber-Widal geheet het.

'n Onafhanklike ontdekking is ook 'n oorsaak vir so 'n samestelling, bv. Stokes was Adams se opvolger as professor van Interne Geneeskunde te Dublin, maar afgesien van hierdie verwantskap het hul 19 jaar na mekaar die sindroom van Stokes-Adams beskryf. Stokes het ook die vorige beskrywing van Cheyne erken toe hy Cheyne-Stokes-asemhaling beskryf het. Onder dié groep val ook nog die Charcot-Marie-Tooth beskrywings en die Reed-Sternberg-selle.

Obstruksie van die lewerare, deur Budd in 1857 beskryf, word in 1899 deur Chiari herontdek en heet toe die Budd-Chiari-sindroom. Die periode van herontdekking is soms kort (Waterhouse 1911 en Friderichsen 1918), terwyl Baumgarten 75 jaar na Cruveilhier die veneuse geruis oor die lewer waargeneem het. Op hierdie wyse word werkers met dieselfde belangstelling oor jare heen verenig en vereer. Dit kan egter belaglik word as 'n mens dink aan terme soos Laurence-Moon-Biedl wat na analogie hiervan die Laurence - Moon - Biedl - Bardet - Solis - Cohen - Weis - sindroom genoem kon word!

Die musikale klank van name rangskik hul soms, eerder as die prioriteit van ontdekking, bv. Pel-Ebstein moes eintlik kronologies andersom gewees het.

Die senior outeur het soms nooit eers geskryf oor die toestand nie, bv. Arrillaga het aan die sindroom wat hy beskryf het die naam van sy leermeester Ayerza geheg. Dit was dus lank bekend as die Ayerza-Arrillaga-sindroom, toe Ayerza s'n, hoewel dit wil voorkom asof ‚cor pulmonale' die hele kombinasie gaan uitwis!

Hoewel operasies gewoonlik net chirurgiese name bevat, is die Blalock-Taussig-operasie, 'n chirurg-internis samestelling, en histories sou Taussig-Blalock miskien meer korrek wees omdat Taussig vir Blalock oorreed het om die subklaviese arterie aan die homolaterale pulmonale arterie te anastomeer.

Austin Flint, Graham Steel en Argyll Robertson is net die volle name van drs. A. Flint, G. Steel en A. Robertson respektiewelik.

Nog baie sulke voorbeelde word genoem in die artikel van Shapiro.[3] Indien nie om die interessantheid daarvan nie, het die eienaam tog waarskynlik sy plek omdat in hierdie samestellings veel van die geskiedenis van die geneeskunde verewig is. Die gebruik van eiename dui byvoorbeeld op grootmoedigheid (waar Pick sy prioriteit prysgee vir die ontslape Niemann in Niemann-Pick se siekte), en op kleinlikheid (waar lang redenasies oor prioriteit en benaming selfs vandag nog in die moderne briewerubrieke van tydskrifte verskyn oor ontslape helde). Ons sien die miskenning van iets groots en sy herontdekking jare later, ook die patos en tragiek van die lewe as ons dink aan Thomsen se siekte. Al het Leyden dit twee jaar vantevore beskryf, en vele daarna, het Julius Thomsen vyf goeie redes waarom myotonia congenita na hom sal heet: Die familie wat hy in 1876 beskryf het, was hyself en sy vier seuns.[1]

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## THE HEALTH OF THE CAPE COLOURED

The Annual Report of the Medical Officer of Health for the City of Cape Town contains detailed information extending over nearly 50 years on the vital statistics of the different ethnic groups that constitute the population of this municipality. Dr. E. D. Cooper has recently published his report for 1957, with provisional statistics for 1958. This excellent

report affords material for statistical studies throwing light on the health conditions in the different racial constituents of a population which has grown* from 163,440 in the year 1916-17 to 517,501† in the calendar year 1957. The 1916-17 population consisted of 53% Europeans and 47% non-Europeans; and the proportion of non-Europeans has since grown until for 1957 it is estimated that the population consists of about 40% Europeans and 60% non-Europeans (of which about 85% are Coloured and the remainder Natives and Indians).

A striking feature of these Cape Town reports has always been the racial disparity in birth rates and death rates. Thus, over 40 years ago (1913-16) the non-European death rate and infant mortality rate were more than twice as great as the European, and there were still greater disparities in the mortality from certain particular conditions such as diarrhoeal, respiratory, tubercular and other infectious diseases. Today the general death rate of the non-European group has become more nearly equal to that of the European—partly owing to differences in age constitution and the higher European mortality from diseases of the heart and arteries and from cancer—but disparities no less great than 40 years ago are still apparent in infant mortality and in diarrhoeal, respiratory, tubercular and other infectious diseases. The reason why this is so notwithstanding the decline in the non-European mortality rates (see below) is that a still greater decline has taken place in the corresponding rates for Europeans.

The other striking feature brought out by the Cape Town report is the great improvement that has taken place in the health of the non-Europeans as reflected by the recorded deaths during the past 40 years. From 1913-16 to 1952-56 the non-European general death rate fell by 55%, the infant mortality rate by 53% and the death rate from tuberculosis by 64%. From 1921-25 to 1951-55 the non-European death rate from bronchitis and pneumonia, and that from measles and whooping cough, both fell by 87%. Since 1955 the non-European mortality under all these headings has continued to decline. In diarrhoeal diseases the improvement had not been so great; the number of infantile deaths from diarrhoea in 1951-55 was only 21% less than that in 1921-25.

The non-European population for which these rates have been extracted includes Natives and Indians, but as the Coloured constitute 85% of the non-Europeans the non-European rates may be taken as broadly reflecting the health conditions of the Coloured people. That this gives a fair approximation is shown by a comparison of available figures for the Coloured and for non-European as a whole.

It is seldom realized that the improvement in the health of the Coloured people as reflected in the Cape Town statistics is such that today their general death rate, their infant mortality rate, and their death rates from bronchitis and pneumonia, measles and whooping cough, are all actually lower than the corresponding rates of the Europeans of Cape Town some 40 years ago—and far lower than corresponding rates for the whole population of England and Wales in the mid-nineteenth century.

What is the explanation of this recent and continuing improvement in the health of the Coloured people of Cape Town? Amongst the chief factors should be placed (1) sanitation and health administration, (2) medical and nursing care of the sick, and (3) social and economic conditions. As regards the first of these, the Coloured share with the Europeans the benefits of modern urban sanitation and administration. As for care in sickness, through the medical and allied professions and the public hospitals, clinics and district nursing, they have at their service most of the great advances in medical science that have been made in recent years. It is hard to appraise the relative importance of the different factors, but from universal experience it is safe to attribute a potent influence on health to social and economic conditions operating through such agencies as nutrition, housing, culture and education, and occupational conditions.

While much has already been accomplished by and for the Cape Coloured, a comparison of their conditions and their health statistics with those of the Europeans in association with whom they live demonstrates how much more remains to be achieved and to what greater heights the Cape Coloured may rise.

* The municipal area was extended by the addition of the Wynberg area (population 25,140) in 1927-28 and Windermere (population 14,235) in 1943-44.

† This figure excludes the population of Langa Native Township (23,123).

# HALOTHANE—A CLINICAL STUDY OF 500 CASES

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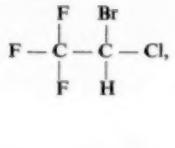
While recent developments have tended to restrict the scope of the inhalation anaesthetic to that of an analgesic component of the respiratory medium, there is a basic physiological simplicity about this method which makes for greater safety and ease of control and it would doubtless attract more attention if some of the shortcomings which limit the value of existing inhalation anaesthetics could be overcome.

Halothane (brom-chlor-trifluoro-ethane), a halogenated ethane having the formula



has recently been the object of considerable interest on account of its potency, non-inflammability, and a number of other properties highly desirable in an anaesthetic. The drug has been developed by Imperial Chemical Industries Ltd.[1,2] under the trade name of Fluothane. Early clinical investigation was carried out in Manchester[3] and in Oxford[4] while, more recently, clinical studies have been undertaken in Canada, the United States and later in South Africa.[14,15] The total number of halothane administrations now available for review already runs into hundreds of thousands, the largest series so far reported being from Manchester.

Halothane is a colourless liquid with a specific gravity of 1·86 and a boiling point of 50°C. It has a pleasant odour

and is non-irritating to inhale. It is a potent agent, the concentrations required for the induction and maintenance of surgical anaesthesia being about the same as for chloroform. Halothane appears to be reasonably stable but, in view of the dangerous nature of its break-down products, strict precautions should be observed with its use and storage. It shows a tendency to oxidize in the presence of heat, light and moisture and should therefore be stored in a cool place in tightly stoppered amber-tinted bottles. The stability of the commercial product is further enhanced by the addition of 0·01% of thymol.

## GENERAL SCOPE OF STUDY

In this clinical trial, in which halothane was administered to 540 cases, the main object was to determine its scope and behaviour when used as a main agent, a necessary prerequisite to the assessment of its place in modern anaesthesia. With this end in view, 459 patients were anaesthetized for a wide variety of operations without the use of any muscle relaxant apart from a normal dose of suxamethonium (50-75 mg.) to facilitate intubation. The only other anaesthetic used was a small induction dose of Na-thiopentone (averaging 300 mg.), which was administered to 407 patients; the remaining 53 had an inhalation induction. Table I shows the operations performed on these 459 patients.

TABLE I. OPERATIONS WITHOUT MUSCLE RELAXANTS EXCEPT FOR INTUBATION

| | |
|---|---|
| *Laparotomy* (8) | |
| Resection of bowel | 2 |
| Biopsy | 1 |
| Colostomy | 2 |
| Drainage | 1 |
| Diverticulectomy | 1 |
| Excision of abdominal sinus | 1 |
| *Gynaecological* (43) | |
| Hysterectomy (abdominal) | 6 |
| Hysterectomy (vaginal) | 4 |
| Vaginal repair | 12 |
| Dilatation and curettage | 21 |
| *ENT* (62) | |
| Tonsillectomy (adult) | 15 |
| Tonsillectomy and adenoidectomy (children) | 15 |
| S.M.R. | 11 |
| Mastoidectomy | 9 |
| Tympanoplasty | 3 |
| Operations on sinuses | 3 |
| Total laryngectomy | 1 |
| Other minor procedures | 5 |
| *Operations on Blood Vessels* (18) | |
| Varicose veins | 14 |
| Femoral embolectomy | 1 |
| Excision of popliteal aneurysm | 1 |
| Aortic/femoral graft | 1 |
| Ligature of common carotid | 1 |
| *Tongue and Jaw* (7) | |
| Mandibulectomy | 2 |
| Hemiglossectomy | 1 |
| Exploration of submaxillary duct | 1 |
| Biopsy | 3 |
| Orthopaedic procedures | 79 |
| Plastic procedures | 40 |
| Inguinal hernia | 38 |
| Ventral hernia | 7 |
| Appendicectomy | 17 |
| Mastectomy (radical) | 11 |
| Mastectomy (local) | 18 |
| Excision of breast tumours | 14 |
| Thyroidectomy | 22 |
| Dissection of cervical glands | 10 |
| Excision of parietal tumours (or F.Bs.) | 16 |
| Sympathectomy (lumbar) | 4 |
| Sympathectomy (Smithwick) | 2 |
| Ophthalmic operations | 6 |
| Urological operations | 8 |
| Haemorrhoids (and other anal procedures) | 21 |
| Other operations | 8 |
| *Total* | 459 |

In a further group, in which major abdominal procedures were carried out, halothane was used with muscle relaxants in the normal manner. Different proportions of relaxant to depth of anaesthesia were tried in an attempt to ascertain whether satisfactory relaxation could be obtained in the presence of adequate natural breathing or whether fully controlled respiration was more satisfactory. Table II shows the operations performed on the 67 patients in this group.

TABLE II. ABDOMINAL OPERATIONS IN WHICH HALOTHANE WAS USED WITH MUSCLE RELAXANTS

| | |
|---|---|
| Gall bladder and bile ducts | 23 |
| Gastrectomy | 19 |
| Bowel resections | 4 |
| Ventral hernia | 5 |
| Pancreatectomy | 1 |
| Hysterectomy | 2 |
| Exploration of aortic graft | 1 |
| Excision of hepatic cyst | 1 |
| Laparotomy and colostomy | 4 |
| Laparotomy with other procedures | 7 |
| *Total* | 67 |

In 14 other cases, muscle relaxants were given as a matter of expediency to afford better operating conditions or to assist control of respiration.

Oral intubation, following the use of suxamethonium, was carried out in 308 cases, and 225 were anaesthetized without intubation; 7 patients were intubated under halothane anaesthesia without the assistance of muscle relaxants. If the anaesthetist is prepared to spend a little extra time on the induction, halothane provides excellent conditions for intubation.

The age of the patients ranged from 7 months to 88 years. Table III classifies the patients into age-groups.

TABLE III. CLASSIFICATION BY AGE

| *Age-group* | *Number of Operations* |
|---|---|
| 0– 5 | 17 |
| 6–10 | 19 |
| 11–15 | 30 |
| 16–20 | 37 |
| 21–30 | 67 |
| 31–40 | 70 |
| 41–50 | 104 |
| 51–60 | 97 |
| 61–70 | 72 |
| 71–80 | 22 |
| 81–90 | 5 |
| *Total* | 540 |

While the majority of the patients could be regarded as reasonably good subjects for surgery, no attempt was made to avoid bad risks and the more important pre-operative pathological findings are listed in Table IV.

Apart from general observation, attention was mainly directed to the effects of halothane on the circulation and respiration, since these reactions are of particular interest

TABLE IV. PRE-OPERATIVE PATHOLOGICAL CONDITIONS

| | |
|---|---|
| Congestive cardiac failure | 7 |
| History of coronary thrombosis | 6 |
| Severe hypertension | 12 |
| Malignant hypertension | 1 |
| Dyspnoea | 7 |
| Tachycardia | 1 |
| Chronic bronchitis | 23 |
| Irradiation fibrosis of lung | 1 |
| Asthma | 3 |
| Emphysema | 13 |
| Severe toxaemia (acute) | 4 |
| Severe toxaemia (chronic) | 3 |
| Diabetes | 3 |
| Bad alcoholics | 7 |
| Gross obesity | 15 |
| *Total* | 106 |

and importance. Charts showing variations in blood pressure, pulse rate, respiration rate and anaesthetic concentration were kept for most of the longer cases.

## TECHNIQUE

### *Pre-medication*

In 60% of adult patients pethidine, 50 mg., and atropine, 1/100 gr. was given 1 hour before operation, light pre-medication being favoured as producing minimal respiratory depression. The physical condition of the patient was naturally taken into account in assessing the dose and the 25% who received 100 mg. of pethidine did not exhibit any marked respiratory depression as compared with the other group. In a limited number of cases other drugs and combinations were used, with apparently satisfactory results, including omnopon and scopolamine, morphine, chlorpromazine and promethazine.

The need for adequate atropinization has been stressed by other writers[3] but, in the present series, the normal pre-operative dose of 1/100 gr. for adults was seldom exceeded. In a small group of cases the atropine was stepped up to 1/50 gr. either by giving this dose pre-operatively or by giving an extra 1/100 gr. intravenously with the thiopentone. This sometimes seemed to reduce fluctuations in blood pressure, but it was also responsible for marked tachycardia and it was therefore felt to be better not to exceed the normal dose unless specific indications arose.

### *Administration*

The semi-closed method of administration was employed almost exclusively, using nitrous oxide and oxygen in flow rates of 7-10 litres per minute as the respiratory medium. As confidence in the agent increased, these flow rates were slightly reduced, but never to much below normal minute-volume requirements, and care was taken to keep the expiratory valve lightly adjusted to minimize re-breathing. In the interests of safety the oxygen content was maintained at somewhat above atmospheric concentrations (usually 30-50%) but experience showed that less than this was normally sufficient to avoid any trace of cyanosis.

For the administration of such a potent agent as halothane, accuracy of control is essential and the use of a vaporizer which lends itself to these requirements is important. Three types of vaporizer were tried:

#### (*a*) *The normal Boyle's trilene or chloroform vaporizer*

In the earlier administrations in this series, a Boyle's trilene vaporizer was employed in a manner similar to that described by Johnstone.[3] The control settings at which gases were first admitted to the vaporizer, and at which the flow through the vaporizer was maximal, were determined and marked on an extended scale, the intervening space being divided into 8 equal sectors. The hood of the plunger was fixed in its highest position. One disadvantage of this arrangement was that the strength of halothane vapour tended to remain low until the control approximated to the half-way mark, after which the increase in concentration was rather sudden.

#### (*b*) *B.O.C. modification of Boyle's trilene vaporizer*

This modification of the standard vaporizer has certain advantages over the improvisation described above. It has no U-tube or plunger, the gases being admitted through a lateral opening in a single tube which ends blindly. This opening is situated a little above the level of the anaesthetic, which should be kept approximately constant for the best results. The inlet and outlet ports of the control drum are much narrower than in the conventional pattern, thus permitting finer variations in the volume of gas admitted. An extended lever is provided with a scale numbered from 0 to 10. This vaporizer gave a more even increase in the vapour strength as the control was advanced.

Simple vaporizers of this type can be calibrated for a fixed anaesthetic temperature with a fixed rate of flow. During an administration, however, the temperature of the fluid in the vaporizer falls as the result of evaporation and the flow of gas may also require modification. Thus, while the vapour strength tends to fall as the anaesthetic proceeds, it is particularly easy to give a dangerous concentration during induction unless care is exercised. The anaesthetist must be familiar with the idiosyncracies of the particular vaporizer he is using but, with due precautions, the two described gave satisfactory results in 135 cases. It is sometimes helpful to make a rough estimation of the vapour strength by taking a tentative sniff at the breathing tube, although the practice is not without its disadvantages.

#### (*c*) *Compensated vaporizers*

By far the best type of vaporizer is one which is thermostatically compensated to give a constant vapour strength at any given control setting for any temperature or flow rate likely to prevail during the administration. In this respect, the Fluotec vaporizer (Cyprane Ltd.) proved highly satisfactory and was used almost exclusively (over 400 cases) as soon as it became available. This apparatus delivers known concentrations of halothane from 0 to 3%. It is compensated for variations in total gas flow over a range of 4—15 litres per minute, for cooling of the anaesthetic by evaporation, for variations in theatre temperature between 60°F and 90°F and for changes in the fluid level. It is thus a great advance in accuracy of control and consequently in safety.

## GENERAL IMPRESSIONS

#### (*a*) *Induction*

Used without intravenous anaesthesia, halothane affords a smooth and comfortable induction which should not be found unpleasant by any reasonably cooperative patient. Consciousness is rapidly lost and the vapour is completely non-irritant in concentrations up to 3%. Induction is also easy from the anaesthetist's point of view since there is little tendency to coughing or breath-holding even in patients suffering from

chronic respiratory infections. Full surgical anaesthesia can usually be reached in about 5 minutes but, although the vapour is respirable up to and beyond the safety limit, it is probably wise to avoid sudden increases in concentration. The intravenous induction has now become such a universally established practice that no inhalation technique is likely to be so acceptable to the great majority of subjects but, if expedient, an inhalation induction with halothane may be confidently undertaken with minimal waste of time or disturbance to the patient. The concentration required seldom exceeds 2·5%, and 2% will usually suffice. Halothane is an excellent induction medium as a preliminary to ether anaesthesia and greatly shortens the time required to reach surgical narcosis. When given after a sleep dose of Na-thiopentone the induction is rapidly and smoothly completed.

Signs indicating depth of narcosis are of limited value. In full surgical anaesthesia the pupils become fixed in the mid-line and are contracted. Recovery is sometimes heralded by a moving or eccentric pupil which may exhibit some degree of dilatation, but anaesthesia with halothane was never pushed to the extent of showing dilatation at deeper levels. Respiration is often quiet and shallow until the subject is surgically stimulated. Deepening narcosis is indicated by respiratory depression, progressive hypotension and, in many cases, by cardiac arrhythmias.

(*b*) *Maintenance*

Halothane is a potent anaesthetic which, unlike trichlorethylene, has a wide useful range. Light anaesthesia, with concentrations varying between 0·5% and 1·5%, gives sufficient relaxation for almost any type of operation outside the abdomen. In a few cases, however, difficulty was unexpectedly experienced in establishing satisfactory surgical anaesthesia and better results were obtained by changing to other methods.

A regular pulse, tending to be slower than with ether, is normal. The skin is warm and dry and the peripheral veins well filled. There is usually a moderate degree of hypotension but, with the vapour concentrations mentioned above, the fall in blood pressure is seldom excessive although bleeding from the operation site is often conspicuously reduced. Spontaneous pulmonary ventilation appeared to be adequate but in some cases marked tachypnoea with decreased tidal volume was observed in relation to surgical stimulation. This reaction has been commented on by other writers.[3, 4, 7]

Sufficient relaxation for abdominal operations, without the use of neuromuscular block, can sometimes be obtained but deeper anaesthesia is usually needed and in these circumstances the toxic effects of halothane are more in evidence; severe hypotension, respiratory depression and cardiac arrhythmias are frequently observed. For major abdominal surgery, there is no doubt that better operating conditions can be obtained with greater safety by employing the more conventional combined methods.

(*c*) *Recovery*

After short administrations recovery is rapid and, provided the induction dose of Na-thiopentone has been minimal, the patient is often conscious before leaving the operating theatre. Even in longer procedures, consciousness normally returns much sooner than would be expected with ether, especially if care is taken to keep the patient in the lightest level consistent with smooth and uninterrupted anaesthesia. In this respect the non-irritating nature of the vapour favours ease of control.

As regards the post-operative well-being of the patient, the frequency with which claims of relative freedom from nausea and vomiting are made for new anaesthetics, and the many factors which may be concerned in this distressing complication, inevitably invites an attitude of scepticism. It can be said, nevertheless, that halothane made an extremely favourable impression. After short administrations carried out on volunteers, there was not the slightest feeling of malaise on recovery, while the number of patients who spontaneously expressed their appreciation, or favourably compared their experiences with those of previous anaesthetics, was impressive.

*Halothane with Muscle Relaxants*

The use of highly potent inhalation anaesthetics in conjunction with muscle relaxants is somewhat at variance with modern trends. As muscle relaxants completely mask the signs by which the depth of narcosis is normally assessed, a potent anaesthetic must only be used in concentrations which could not *per se* result in overdose. A vaporizer capable of delivering known percentages is thus of great advantage.

Profound hypotension has been reported after the use of a combination of halothane with d-tubocurarine, but suxamethonium and gallamine appear to be free from this danger and in no instance was any additional fall in blood pressure observed which was attributable to the use of either. Gallamine was found to be the most satisfactory relaxant to employ.

For abdominal surgery, the usual procedure consisted of oral intubation after a sleep dose of Na-thiopentone and 50—75 mg. of suxamethonium. The lungs were then gently inflated with nitrous oxide, oxygen and halothane, which was progressively increased up to 1·5% or 2%; artificial ventilation being continued until normal breathing was re-established. Before the abdomen was opened, gallamine (80—120 mg.) was given and the halothane reduced to 1% or lower. Pulmonary ventilation was then controlled, a soda-lime filter being used, with a total gas flow of 5 litres per minute. In some of the later cases this flow was reduced to 3½ litres per minute, the concentration of halothane being correspondingly reduced in view of the increased re-breathing. Further additions of gallamine (in doses of 20 mg.) were given as required, but often little was needed after the initial dose. Adequate spontaneous breathing was usually present at the end of the operation. By maintaining deeper anaesthesia (with halothane up to 2%) it was sometimes possible to obtain satisfactory relaxation without assisting pulmonary ventilation, but the precipitation of severe tachypnoea was a frequent complication and the technique described above proved more reliable.

The use of light halothane anaesthesia with muscle relaxants in abdominal surgery permits of a better balance between the anaesthetic and the neuromuscular block, without introducing the explosion hazard. The dangers associated with both incomplete anaesthesia and overdose of relaxant can be reduced.

## EFFECT ON RESPIRATION

The two most significant effects of halothane on the respiration are (*a*) depression of pulmonary ventilation in deep

anaesthesia, and (*b*) a tendency for marked tachypnoea to develop in association with surgical stimulation.

(*a*) *Respiratory Depression*

According to Bryce-Smith,[4] respiratory depression is one of the greatest disadvantages of halothane, and it is certainly one of the factors which limit its scope as a main agent. Unlike ether, there is no reflex stimulation of breathing by irritation of the upper respiratory mucosa, and respiration is often quiet and shallow before the commencement of the operation. As a result, the progress of the induction may sometimes be slow and it is not uncommon for the patient to move unexpectedly when the incision is made. The condition resembles the 'chloroform sleep' familiar to anaesthetists of the past and, if light stimulation is permitted, the resulting quicker and deeper breathing rapidly completes the induction.

With the operation in progress, pulmonary ventilation did not appear to be noticeably depressed in light or moderate anaesthesia. In a short series of 10 cases an attempt was made roughly to measure the minute volume by incorporating a non-return valve and adjusting the gas flow so that the breathing bag remained in a steady state of semi-deflation. Leaks were minimized by using a cuffed endotracheal tube or by the careful adjustment of an accurately fitting face-piece. It was found that the minute volume of individual subjects often showed wide fluctuations during the course of the anaesthetic, sometimes varying between 4 and 12 litres per minute.

(*b*) *Tachypnoea*

The respiratory rate during the operation is also widely variable, averaging about 25—35 per minute, but tachypnoea of 50—60 per minute may develop in response to surgical stimulation. This may be attributable to sensitization of the Hering-Breuer reflex, and the exceptional ease with which the respiration can be controlled in halothane anaesthesia seems to support this view. It is not necessary to make any attempt to modify respiratory rates of up to 40 per minute, but at 50 per minute (or over) the tidal volume may be reduced to such an extent that pulmonary ventilation is inadequate while, at the same time, the efficiency of the respiratory effort is reduced by the increased effect of the dead space. Intravenous pethidine is recommended by Johnstone[3] to control excessive tachypnoea and was found to be moderately effective. A better treatment, however, is to control breathing and ventilate the lungs artificially. This is facilitated by muscle relaxants but is often possible without such assistance.

## EFFECT ON THE CIRCULATION

A fall in blood pressure, often accompanied by diminished bleeding from the operation site, is a striking feature with halothane anaesthesia. There is a tendency to slowing of the pulse and, in isolated cases, extreme bradycardia has been observed; other cardiac arrhythmias may also occur. All these reactions are more associated with deep anaesthesia; in the lighter planes the effect of halothane may be more than balanced by the pressor effects of surgical stimulation.

*Hypotension*

As the mechanism of the fall in blood pressure is of considerable importance in the assessment of the intrinsic safety of the agent, it has been the subject of much experimental investigation. Raventos[1] believes that the hypotension is occasioned by pooling of the blood as the result of peripheral

TABLE V. EFFECT OF HALOTHANE ON SYSTOLIC AND PULSE PRESSURES

| *Preop. Syst. B.P.* | *Preop. Diast. B.P.* | *Min. Syst. B.P.* | *Max. Syst. Fall* | *% Syst. Fall* | *Preop. Pulse Press.* | *Min. Pulse Press.* | *Max. Pulse Fall* | *% Pulse Fall* |
|---|---|---|---|---|---|---|---|---|
| (*A*) 51 *patients receiving Na-thiopentone induction* | | | | | | | | |
| 122 | 88 | 100 | 22 | 18·0 | 34 | 25 | 9 | 26·0 |
| 110 | 70 | 85 | 25 | 22·7 | 40 | 25 | 15 | 37·5 |
| 110 | 70 | 90 | 20 | 17·0 | 40 | 30 | 10 | 25·0 |
| 114 | 70 | 52 | 62 | 54·4 | 44 | 8 | 36 | 81·8 |
| 116 | 74 | 66 | 50 | 43·1 | 42 | 10 | 32 | 76·2 |
| 140 | 95 | 75 | 65 | 46·5 | 45 | 10 | 35 | 77·8 |
| 124 | 90 | 50 | 74 | 59·6 | 34 | 10 | 24 | 70·6 |
| 140 | 80 | 145 | −5 | −3·6 | 60 | 40 | 20 | 33·3 |
| 100 | 60 | 100 | 0 | 0·0 | 40 | 15 | 25 | 62·5 |
| 130 | 90 | 120 | 10 | 7·7 | 40 | 20 | 20 | 50·0 |
| 130 | 90 | 84 | 46 | 35·4 | 40 | 12 | 28 | 70·0 |
| 126 | 80 | 70 | 56 | 44·4 | 46 | 20 | 26 | 56·5 |
| 112 | 82 | 83 | 29 | 25·9 | 30 | 15 | 15 | 50·0 |
| 110 | 70 | 80 | 30 | 27·3 | 40 | 15 | 25 | 62·5 |
| 124 | 92 | 70 | 54 | 43·5 | 32 | 12 | 20 | 62·5 |
| 120 | 80 | 95 | 25 | 20·9 | 40 | 15 | 25 | 62·5 |
| 120 | 80 | 115 | 5 | 4·2 | 40 | 25 | 15 | 37·5 |
| 130 | 90 | 90 | 40 | 30·8 | 40 | 20 | 20 | 50·0 |
| 132 | 82 | 100 | 32 | 24·2 | 50 | 30 | 20 | 40·0 |
| 142 | 96 | 120 | 22 | 15·5 | 46 | 36 | 10 | 21·7 |
| 125 | 80 | 78 | 47 | 37·6 | 45 | 10 | 35 | 77·8 |
| 110 | 80 | 100 | 10 | 9·1 | 30 | 20 | 10 | 33·3 |
| 110 | 80 | 90 | 20 | 18·2 | 30 | 22 | 8 | 26·7 |
| 120 | 74 | 75 | 45 | 37·5 | 46 | 25 | 21 | 45·6 |
| 120 | 80 | 110 | 10 | 8·3 | 40 | 20 | 20 | 50·0 |
| 140 | 80 | 100 | 40 | 28·6 | 60 | 16 | 44 | 73·3 |
| 110 | 50 | 90 | 20 | 18·2 | 60 | 30 | 30 | 50·0 |
| 132 | 92 | 108 | 24 | 18·2 | 40 | 22 | 18 | 45·0 |
| 140 | 96 | 114 | 26 | 18·6 | 44 | 20 | 24 | 54·5 |
| 120 | 80 | 105 | 15 | 12·5 | 40 | 25 | 15 | 37·5 |
| 135 | 80 | 100 | 35 | 26·0 | 55 | 20 | 35 | 63·6 |
| 120 | 80 | 90 | 30 | 25·0 | 40 | 30 | 10 | 25·0 |
| 100 | 70 | 85 | 15 | 15·0 | 30 | 20 | 10 | 33·3 |
| 126 | 80 | 80 | 46 | 36·5 | 46 | 20 | 26 | 56·5 |
| 130 | 90 | 100 | 30 | 23·1 | 40 | 18 | 22 | 55·0 |
| 140 | 100 | 104 | 36 | 25·7 | 40 | 22 | 18 | 45·0 |
| 120 | 80 | 105 | 15 | 12·5 | 40 | 20 | 20 | 50·0 |
| 132 | 82 | 96 | 36 | 27·3 | 50 | 28 | 22 | 44·0 |
| 120 | 70 | 80 | 40 | 33·3 | 50 | 20 | 30 | 60·0 |
| 132 | 84 | 118 | 14 | 10·6 | 48 | 28 | 20 | 41·7 |
| 120 | 80 | 100 | 20 | 16·7 | 40 | 30 | 10 | 25·0 |
| 130 | 75 | 80 | 50 | 38·4 | 55 | 20 | 35 | 65·5 |
| 130 | 70 | 90 | 40 | 30·8 | 60 | 20 | 40 | 66·7 |
| 118 | 80 | 100 | 18 | 15·3 | 38 | 20 | 18 | 47·4 |
| 120 | 75 | 100 | 20 | 16·7 | 45 | 40 | 5 | 11·1 |
| 140 | 90 | 120 | 20 | 14·3 | 50 | 20 | 30 | 60·0 |
| 130 | 75 | 90 | 40 | 30·8 | 55 | 20 | 35 | 65·4 |
| 130 | 80 | 95 | 35 | 27·0 | 50 | 25 | 25 | 50·0 |
| 120 | 86 | 90 | 30 | 25·0 | 34 | 20 | 14 | 41·2 |
| 140 | 90 | 76 | 64 | 45·7 | 50 | 18 | 32 | 64·0 |
| 120 | 80 | 80 | 40 | 33·3 | 40 | 15 | 25 | 62·5 |
| (*B*) 11 *patients receiving no Na-thiopentone* | | | | | | | | |
| 140 | 100 | 104 | 36 | 25·8 | 40 | 22 | 18 | 45·0 |
| 140 | 100 | 120 | 20 | 14·3 | 40 | 25 | 15 | 26·7 |
| 130 | 95 | 108 | 22 | 16·9 | 35 | 18 | 17 | 48·6 |
| 120 | 80 | 102 | 18 | 15·0 | 40 | 30 | 10 | 25·0 |
| 110 | 70 | 90 | 20 | 18·2 | 40 | 20 | 20 | 50·0 |
| 120 | 80 | 110 | 10 | 8·3 | 40 | 40 | 0 | 0·0 |
| 130 | 100 | 130 | 0 | 0·0 | 30 | 30 | 0 | 0·0 |
| 140 | 90 | 120 | 20 | 14·3 | 50 | 30 | 20 | 40·0 |
| 120 | 80 | 105 | 15 | 12·5 | 40 | 25 | 15 | 37·5 |
| 110 | 50 | 90 | 20 | 18·2 | 60 | 30 | 30 | 50·0 |
| 110 | 80 | 90 | 20 | 18·2 | 30 | 24 | 6 | 20·0 |

Preop.= pre-operative. Syst.= systolic. Diast.= diastolic. B.P.= blood pressure. Min.= minimum. Max.= maximum. Press.= pressure. Syst. Fall= fall in systolic blood pressure. Pulse Fall= fall in pulse pressure.

ganglion block. On the other hand, a report from the Medical Research Council[5] suggests that halothane reduces the cardiac output and is, in this respect, 70% as potent as chloroform. In this report the opinion is expressed that direct myocardial depression plays an important part and that ganglion block is a minor factor.

Observation of blood-pressure variations in a group of 62 cases, which were selective only in so far as their pre-operative blood-pressure figures fell within reasonably normal limits, appeared to suggest a diminished cardiac output. In these cases the following factors were noted: (*a*) The pre-operative systolic, diastolic and pulse pressures, and (*b*) the lowest systolic and the lowest pulse pressure recorded during the administration. From these data, the *maximum fall in systolic pressure* and the *maximum fall in pulse pressure* were calculated *as percentages of their pre-operative values*. In 51 cases anaesthesia was induced with a small dose of Na-thiopentone while in the remaining 11 an inhalation induction was employed. The figures are set out in Table V; they show that:

(*a*) In a group of 51 cases which were induced with Na-thiopentone the percentage fall in pulse pressure was substantially greater than that in systolic blood pressure in every case except one. The average fall in systolic blood pressure was 26·4% and that in pulse pressure 49·8%.

(*b*) In 11 cases where the intravenous induction was omitted the same tendency was shown and the percentage fall in pulse pressure was greater than that in systolic blood pressure in all but 2 cases. The average fall in systolic blood pressure was 14·7% and that in pulse pressure 31·2%.

Maximum falls in both systolic blood pressure and pulse pressure often followed an attempt to 'push' the anaesthetic, and were frequently noticed in the post-induction period, before the vapour strength had been reduced. In the latter case, Na-thiopentone may have been a factor, but the figures for Group B in Table V do not suggest that it was an important one. Most of the records showed that the diastolic pressure was relatively well maintained and, in a considerable number of cases, it actually rose. Taken collectively, all these observations seem to point to a diminished ventricular stroke volume.

There would thus appear to be 3 possible factors which may be concerned in the hypotension associated with halothane narcosis, viz. (*a*) peripheral ganglion block, (*b*) central vasomotor depression, and (*c*) direct action on the myocardium. Up to the present, there is no unanimity of opinion on which is the most important.

*Arrhythmias*

The effect of halothane on cardiac neuromuscular transmission has been studied electrocardiographically by Johnstone,[3] who found that normal sinus rhythm usually persisted throughout the administration. In some cases, especially where higher concentrations were used, arrhythmias of the vagal type were noted, including sinus bradycardia, A.V. nodal rhythm and coupled sinus beats; all these irregularities could be controlled by the administration of atropine. On a few occasions ventricular extrasystoles were observed in association with under-ventilation but disappeared when this was rectified.

In the present series cardiac arrhythmias were seldom noted with concentrations below 1·5% (except where irregular heart action was present pre-operatively), but occurred more frequently with higher concentrations. Irregular pulses were observed in about 5% of all subjects and included extrasystoles (11), bradycardia (2), tachycardia (6), pulsus alternans (4) and pulsus bigeminus (1). The irregularities were for the most part similar in type to those associated with cyclopropane anaesthesia. When conditions permitted, the anaesthesia was lightened and this often resulted in the restoration of normal rhythm. If not, provided the peripheral circulation and blood pressure remained satisfactory, no further action was deemed necessary. Halothane was administered with perfectly satisfactory results to patients suffering from gross cardiac disease.

*Dangerous Circulatory Complications*

Up to the present, at least 7 cases of cardiac arrest under halothane have been reported,[6–9] one of which terminated fatally. In some of these records the clinical details are not sufficiently complete for accurate assessment, but in each case the anaesthetic technique seems to have involved re-breathing or the use of vaporizers capable of giving dangerously high concentrations. From the available data, therefore, overdose cannot be ruled out as a possible (or even probable) causal factor. It also appears significant that these grave complications were invariably associated with the early phases of a trial and that they were eliminated as increased experience and respect for the potency of the drug were acquired. Up to the present there is nothing in the available literature to suggest that halothane in moderate concentrations is liable to cause sudden cardiac arrest, although it may be a contributory factor if adrenalin is injected in a subject under halothane anaesthesia. Brennan,[10] on the backing of impressive clinical experience, believes that concentrations up to 2% are safe, but, with such a potent agent it would be dangerous to assume that there is a wide margin between normal and potentially dangerous dosage. The following case is worth quoting:

A somewhat obese but otherwise healthy girl of 16 was being operated on for the removal of an interval appendix. She was big for her age, and highly nervous, and was premedicated with 100 mg. of pethidine and 1/100 gr. of atropine 1 hour before operation. For induction, 500 mg. of Na-hexobarbitone was administered intravenously, followed by the inhalation of nitrous oxide and oxygen (5/3) with halothane, which was raised to 2·5% and, when adequate surgical anaesthesia was thought to be present, reduced to 2%. When the skin incision was made the patient moved slightly and the halothane was again raised to 2·5%, with the desired result. While the muscles were being separated the surgeon complained of inadequate relaxation, whereupon the control was advanced to 3%, the pulse being kept under continuous observation. At this stage the pulse was 120, full and regular, but within a minute or so it became suddenly irregular and almost imperceptible. The halothane was immediately turned off and pure oxygen administered, which brought about an equally dramatic return of the pulse to its previous rhythm and volume. The operation was completed with 1·5% to 2% of halothane without further incident.

While no electrocardiograph records are available in the above case, a strong impression was left that a cardiac arrest was imminent if prompt action had not been taken, and any sudden slowing or weakening of the pulse, or precipitant fall in blood pressure, must be regarded as urgent danger signals. Such sudden hypotension and reduction in pulse volume, following an injudicious attempt to improve abdominal relaxation, were observed on several occasions in the earlier stages of this investigation, and the necessity for close

observation of the circulation if higher than normal concentrations of halothane are being administered cannot be overstressed. If, however, temptation to 'push' the anaesthetic is resisted and attention is focussed on using the minimum amount required for satisfactory anaesthesia, such complications need not occur.

### EFFECT ON LIVER AND METABOLISM

Observations in this field were confined to general clinical assessment with the exception of one case where liver function tests were carried out before operation, 48 hours after operation, and 6 weeks later. This operation was a total laryngectomy lasting 10½ hours, for which halothane was used throughout as the main agent and which, therefore, provided a particularly severe test. In this case there was some residual depression of liver function but no evidence of serious impairment although the patient was in poor general condition and liver function was not normal before operation.

In the whole series, which included 203 operations lasting between 1 and 2 hours, 43 between 2 and 3 hours, 10 between 3 and 4 hours, 1 between 4 and 5 hours, and 1 over 5 hours, clinical evidence of liver damage was entirely absent. Nausea and vomiting during the recovery period occurred in a few cases but were usually minimal; in no instance was post-operative jaundice observed. The effect of halothane on liver function has been studied by Brindle *et al.*[11] in neuro-surgical cases and their findings are in agreement with the above observations. It would, therefore, appear that while protracted halothane anaesthesia does cause some depression of liver function it compares favourably with most other anaesthetic agents in this respect.

### MORTALITY

There were no deaths in this series that could be attributed to the anaesthetic. One patient died in the immediate post-operative period. This was a man of 49 suffering from a large carotid-body tumour for which ligation of the common carotid artery was performed. The anaesthesia was uneventful but on return to the ward the patient developed a hemiplegia, became unconscious, and died about 24 hours later.

### COMPARISON OF HALOTHANE AND CHLOROFORM

As a halogenated hydrocarbon of high potency, halothane invites comparison with chloroform, especially in its efficiency as an anaesthetic and its effect on the heart and circulation. Such a comparison is not so easy as it might appear, for in specialist practice chloroform has been little used as a main agent for the past 30 years and the post-war generation of anaesthetists has little or no experience with it. Recent work carried out in the department of anaesthesiology of the University of Wisconsin under the direction of Dr. Ralph Waters,[12] and aimed at the reassessment of chloroform in the light of modern experience, is of great assistance.

As a result of extensive experimental and clinical observation, Waters and his co-workers conclude that chloroform affects reflex cardiac automaticity and has a direct depressant action on the myocardium. Out of 52 cases where chloroform was administered to human subjects, and which were monitored electrocardiographically throughout, only 5 failed to show cardiac irregularities. No less than 36 patients exhibited ventricular extrasystoles and 20 ventricular tachycardia, signs indicative of increased myocardial irritability. Johnstone,[3] on the other hand, reporting on 500 halothane cases where electrocardiograms were taken, found that sinus rhythm normally persisted at a steady rate. Ventricular extrasystoles were only observed on 12 occasions and in all cases could be attributed to inadequate pulmonary ventilation, for the irregularity disappeared as soon as steps were taken to improve it.

As regards potency, the vapour concentrations of halothane and chloroform which are required to induce and maintain surgical anaesthesia, and the time necessary for induction in each case, are about the same but, if the capacity to provide adequate relaxation for abdominal surgery with a workable margin of safety is accepted as the criterion of potency, chloroform is by far the more powerful agent. In the Wisconsin trials it was used as the sole agent for upper abdominal surgery, and without the assistance of any muscle relaxant just as it has been employed for the best part of a century. Experience has shown this type of surgery to be beyond the useful scope of halothane anaesthesia and also that halothane may, in overdose, be extremely dangerous. If, therefore, the comparison is made on the above terms, halothane must be accepted as having a lower safety margin. The same criticism could, of course, be levelled at many drugs which have a valuable place in modern anaesthesia, and it only implies that halothane could not have fulfilled the role of universal anaesthetic in the manner in which ether and chloroform have done in the past. There is, however, no longer any need for such a role and the available evidence seems to indicate that if the use of halothane is confined to cases where satisfactory anaesthesia can be maintained with 1·5% or less it can be employed with safety and confidence without fear of precipitating serious cardiac complications.

### DISCUSSIONS AND CONCLUSIONS

Probably most anaesthetists would agree that the most valuable single property of halothane is its non-inflammability; but its considerable potency and wide range of usefulness give it a great advantage over trichlorethylene, while its rapid action, ease of administration and relatively short recovery period are all attractive attributes. Elimination of the necessity for repeated intravenous injections during the course of the operation is often a welcome convenience.

Halothane is an excellent induction medium and is not unpleasant to the patient even if, for any reason, it is thought advisable to omit the intravenous administration of Nathiopentone. The infrequency of disagreeable post-operative sequelae is a further advantage.

There is a tendency for bleeding from the operation site to be reduced which, from the surgeon's point of view, makes halothane a popular choice in plastic surgery, otolaryngology, thyroidectomy and other procedures where bleeding is likely to be troublesome. Reduced bleeding, however, is not invariable and it is inadvisable to use deep anaesthesia merely to provide a bloodless operation field. Halothane should be regarded as an agent which may ordinarily be expected to give relatively satisfactory conditions in this respect but it should never be used *specifically* for its hypotensive effects.

Most of the characteristics of halothane appear to commend it as an almost ideal answer to the problems of anaesthesia in neurosurgery. Unfortunately, natural conservatism prevented an adequate trial in this field, but reports have been most

encouraging and its use has been favourably commented on by other writers.[11]

In spite of its high cost, there is a growing demand for halothane and its scope is potentially wide; time alone will determine its exact place in anaesthesia. When used with muscle relaxants, halothane anaesthesia would obviously be applicable to practically any type of surgical procedure, but in these circumstances minimal demands are made on the anaesthetic, so that its comparative value is largely a matter of individual opinion.

Perhaps the most important point to be born in mind is the fact that halothane is a powerful and rapidly acting anaesthetic which, in overdose, may easily produce cardiac arrest. The safety margin between normal and dangerous concentrations is not known with certainty, but may be assumed to be a factor showing considerable variation in different individuals and it is probably influenced by other circumstances connected with the administration. Brennan[10] mentions 2% as an arbitrary safe limit for maintenance, while in the series of cases under discussion a case is recorded where 3% produced alarming symptoms in a healthy subject. While acceptable relaxation of the abdominal muscles cannot be uniformly produced without having recourse to potentially dangerous concentrations, it is safe to say that the possibility of cardiac arrest in the absence of overdose is extremely remote provided that gross anoxia, or the introduction of adrenalin into the circulation of a subject under halothane anaesthesia, are avoided.

The method of administration of halothane is worthy of special consideration. In his original investigation, Johnstone[3] used a semi-closed method with a total gas flow of 10 litres per minute, but the high cost of the agent has led to the increasing popularity of re-breathing techniques.[10, 13] Doubtless these methods can be reasonably safe with expert individual supervision but there are strong arguments against their general use. Accurate control of the vapour strength is more difficult and great care is needed to avoid dangerous concentrations in the breathing system. Further, an adequate gas flow, especially if delivered through an endotracheal tube, is a valuable safeguard against under-ventilation because it eliminates dead space and helps to flush out the lungs by convection; these advantages are lost when the flow of gas is restricted. The significance of these points is enhanced by the fact that halothane anaesthesia may sometimes be associated with a tendency to under-ventilation and Johnstone[3] has attributed the occurrence of ventricular extrasystoles to this factor. It is felt, therefore, that the only advantage of closed-circuit techniques is on the grounds of economy and that they have nothing to contribute in the interests of safety.

To sum up, it is suggested that the following principles should be observed when halothane is administered:

1. Its scope, as a main agent, should be limited to the type of operative procedure which can be handled satisfactorily with moderate concentrations (say 2—2·5% for induction and 1—1·5% for maintenance). Where any difficulty is experienced in maintaining satisfactory anaesthesia, it is better to employ muscle relaxants or to change to some other method.

2. The vapour strength should be carefully controlled; the use of a vaporizer capable of delivering known percentages being the ideal way of achieving this.

3. The pulse and blood pressure should be kept under close observation when approaching the arbitrary safe limits.

4. It is necessary to be on the look-out for tachypnoea and under-ventilation. If there is any doubt about the adequacy of natural breathing, the anaesthetist should assume control and ventilate the lungs artificially.

5. It is advisable to observe the same precautions with regard to injections of adrenalin as would be applicable to chloroform or cyclopropane.

We wish gratefully to acknowledge the kindness of Imperial Chemical Industries (S.A.) Ltd. both for supplying a generous amount of Fluothane for this work and for keeping us briefed on latest developments. We are also indebted to Messrs. African Oxygen Ltd. for their loan of the B.O.C. Vapourizer. Thanks are also due to our fellow anaesthetists who supplied clinical details of many cases and to their surgical colleagues for their helpful patience in the earlier stages of the trial.

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## SYMPOSIUM ON PSORIASIS*

### A FAULT OF EPIDERMAL PROTEIN METABOLISM IN PSORIASIS: A BIOCHEMICAL REVIEW

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During 1958 an American award of $1,000 was made to three workers at the Berne dermatological clinic for their outstanding research on psoriasis. I shall present here some particulars from their prize-winning articles.

Paschoud, Schmidli and Keller, the three investigators, started their work by improving the way of recovering amino acids and certain peptides from the skin. They worked throughout with small fresh razor-shavings of the skin, which seemed mostly to include all the epidermis and a little of the upper corium. By prompt fixation in chilled absolute alcohol, autolysis and the loss of water-soluble components were prevented, and after this the skin slice was cut fine, homogenized and dried to a powder. This dry powder was the standard from which hot aqueous extracts were made. In these extracts the total content of amino acids and of water-soluble peptides was determined. The former was done by Folin's aminonitrogen method, and the latter by the increase in amino-nitrogen after hydrolysis of the peptides by acid digestion in a sealed tube.

In normal skin a fairly stable level of amino acids was found, with a noteworthy presence of acidic amino acids (aspartic and glutamic acids) in the paper chromatograms made of them. In contrast, the hydrolysed water-soluble polypeptides showed a wider range of amino acids in them and contained cystein and

* Held by the Transvaal Sub-group of the Dermatological and Venereological Group of the Medical Association of South Africa, Pretoria, 22 November 1958.

some basic amino acids (lysine, argine, histidine) which were not characteristic of the free amino-acid mixture.

The polypeptide fraction being rather unstable was less constant in amount and composition than the amino-acid fraction, but a normal range could nevertheless be established. Its exact constitution was not further analysed; high-voltage paper electrophoresis may ultimately help in doing this.

The workers repeated these determinations on the unaffected and the affected skin in patients with psoriasis. The unaffected skin was found to resemble the normal values from non-psoriatic individuals, and in the lesions themselves the amino-acid level was also normal. However, the psoriasis lesion itself showed a statistically highly significant diminution in water-soluble peptides. The value was about half that of the normal average value. Two explanations for this were considered, namely a dilution effect due to the scales, and a non-specific inflamatory decrease in the peptides. A few control tests were made on scale-free lesions and various inflammatory conditions, but the decrease in water-soluble peptides was found to be confined to the lesions of psoriasis, and was not due to the presence of scale or inflammation.

A possible reason for reduced peptide concentration in psoriasis may be a lack of the enzymes causing protein and peptide breakdown. Since little is known about the properties and activity of epidermal peptidases, the Swiss investigators prepared some dialysed fresh skin homogenates uncontaminated with therapeutic metals to investigate their lytic activity on some simple peptide substrates. The assay of enzyme activity was again made by determining the rise in aminonitrogen by Folin's method as the substrates were hydrolysed.

A marked reduction in the activity of certain dipeptidases was established beyond question. Although this may naturally have little direct bearing on the low polypeptide values, it is nevertheless suggestive besides being interesting in itself. Further study of the enzyme activity in psoriasis material showed that these enzymes were not in fact lacking, but were functionally inhibited, and that the activity could be made to approach normal by removing this brake. Other inflammatory skin disorders, as was the case with the soluble peptide levels, did not show any similar disturbance in peptidase activity, thus making the enzyme inhibition a characteristic of the psoriatic lesion.

Some studies were made into the nature of this enzyme inhibition. It was noted that cobalt exerted its normal activating influence on glycylglycine dipeptidase. Also, the flocculation of an unknown substance after storage of the psoriasis skin homogenates led to a rise in their dipeptidase activity to near normal. Lastly it was found that by preparing a homogenate from scale-stripped lesions, the pure Malpighian layer gave near-normal values of enzyme activity. The workers therefore suggested that some inhibitory substance was possibly formed in the Malpighian layer which was stored in concentrated form in the scales. Whole-epidermis homogenates would therefore be relatively inhibited. This last conclusion is difficult to integrate with the histochemical findings of Braun-Falco, who, using a synthetic histochemical substrate, noted an inhibited aminopeptidase activity in the Malpighian layer in psoriasis. Here the contamination with scale material could not affect the reaction as it does in a biochemical technique, and if the results can at all be compared, the activity should also have been nearly normal histochemically.

Confirmation and extension of these studies will be eagerly awaited, as they indicate a fruitful biochemical approach to the understanding of psoriasis.

## THE TREATMENT OF PSORIASIS: CONSULTING ROOM ASPECTS

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I feel that I can best use the time at my disposal by avoiding any attempt at a wide review of my subject and by confining myself to a few challenging and perhaps controversial statements, largely in the hope that they will stimulate discussion. Consequently, much of what I shall say will probably be proved incorrect, none of it will have statistical backing, but in all of it there will be, I believe, some basis of truth.

Chronic psoriasis *en plaques* in the adult seems to me to be as far removed from the acute guttate psoriasis of the child as chronic nephritis is from acute nephritis. Both occur chiefly in the young, and both sometimes follow an upper respiratory infection. Are they not both allergic responses to coccal infection, differing only in the shock organ affected? Cases of arthropathic psoriasis would appear to have a similar pathogenesis, which leads me to the conclusion that the secret of this common disease lies in such a mechanism and not in some obscure biochemical upset.

Why is the pate spared in psoriatics who also show male baldness? It is some years since the lie was given to the statement that psoriasis does not occur in the non-European. It is therefore unlikely that this statement, that I have never seen involvement of the scalp in association with this kind of baldness, will survive this afternoon's meeting. I have never had the opportunity of examining tribal Natives in large numbers. Could not the psoriasis that we see in those attending our Transvaal clinics have been introduced amongst them by miscegnation as porphyria seems to have been. That there is a hereditary predisposition to the disease, I have no doubt. There must in addition be several external causes which act as precipitating factors. Bacterial allergy, I have mentioned. Trauma can also act in this way, and an injury can determine the site of the original lesion, as well as producing a Koebner effect when dissemination is occuring. I have under my care at present a meter reader who cut off the electrical supply of a family who had not paid their account, whereupon the irate housewife threw stones at him and hit him on the leg. His psoriasis started at the site of the injury and has since spread.

There are many atypical forms of the disease and for a survey of some of those which are commonly recognized I cannot do better than refer you to Michelson's recent article in the *Archives*.[1] I would go further and say that anything which seems to a dermatologist to be psoriasis (and a dermatologist is not likely to be mistaken about Bowen's disease or anything similar if consideration is given to all the factors) probably is psoriasis; and will certainly respond to treatment in the manner of psoriasis. The position approximates to what the teachers of the last generation had to say regarding the diagnosis of syphilis—an awareness of its possible presence is of great help and importance in its detection.

As far as treatment goes, my nihilism of former years is being replaced by a feeling that sometimes something can be done. Triamcinolone is part of that something. Apart, however, from the cost, which worries everyone, almost all of those on an effective dose complain of headaches, and a peculiar flatness or lack of energy. Many have stomach pain and polyuria, the latter even when they have not previously been on steroids. One or two suffer loss of libido. These side-effects are so much more noticeable with this drug than with prednisone that, apart from cases of psoriasis, I have now returned to prescribing meticorten as my steroid of choice. The two cases which I have recently had in hospital on aminopterin have not improved even by 1% and the same might be said of those to whom I have given riboflavine. As a local application I have not found anything better than ½% dithranol in Lassar's paste rubbed in well twice a day with a toothbrush and used in combination with tar baths, ultraviolet light and vitamin $B_{12}$ in my own modification of Joeckerman's regime. It is unfortunate that the non-staining chrysocreme appears to be as ineffective as it is inconspicuous. Superficial radiotherapy, in the 40-70 KV range of which my apparatus is capable, is of value chiefly in hitherto untreated cases of recent onset. Even if improvement follows a first course of therapy, repeat treatment at a later date seems much less effective and I therefore await with great interest the remarks of Dr. Loewenthal to whom I now give the floor, on his experience with grenz rays.

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## TREATMENT OF PSORIASIS WITH GRENZ RAYS AND ULTRA-SOFT RAYS

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X-rays have been used in the treatment of psoriasis for over 50 years and in most types the immediate results are satisfactory. Unfortunately psoriasis is well known for its tendency to recur in previously affected areas and these recurrences usually happen relatively quickly, i.e. before the tissues have had time to recover from irradiation. Further X-ray therapy then entails risking permanent damage to the skin. The use of ultra-soft and grenz rays in psoriasis is recommended, not because their beneficial effect is greater, or even as great, at the same surface dosage, but because the danger of producing permanent damage to the skin and subcutaneous tissues is far less.

The advantages of grenz and ultra-soft X-ray therapy derive from the following 3 facts:

1. A quality of radiation can be used of which 50% is absorbed in the upper layers of the skin. The precise depth at which this 50% absorption occurs can be selected from a depth of 0·3 mm. to one of 3·5 mm., according to varying kilovoltage (10-30) and qualities of filtration. Below this 50% level falling-off proceeds at such a rate that at a depth of 3·5 mm. only 10% of the original quantity of radiation emitted at 10 kv. survives; this is reduced to 4% at a depth of 6 mm.[1]

2. It is generally agreed that serious permanent sequelae do not follow unless the necessary quantity of radiation has reached a depth of 3 mm.

3. Whether the initial lesion of psoriasis is in the epidermis or in the capillaries of the upper corium[2] is of little practical importance, because it is certainly to be found in the outer half millimetre of skin, according to either theory.

Thus a form of radiation which exerts its maximum effect in the upper half millimetre of skin, and falls off rapidly in the deeper layers, would appear to be ideal. Rays emitted between 10 and 30 kv. will thus be appropriate for all forms of psoriasis, the latter being used where surface scaling is marked, or where the presence of hair (as on the scalp) forms a barrier to the softer rays.

### METHODS

My own experience comprises relatively few cases who could be followed up; it must be remembered that to treat widespread psoriasis is time-consuming and that in practice one treats only those lesions which are a social handicap. In the 14 cases reviewed here, lesions of the hands were treated in 8, elbows in 6, face and ears in 3, ankles and scalp in 2 and legs or knees in 1 each. Grenz rays (10 - 14·5 kv.) were used in 17 instances and ultra-soft rays (29 kv.) in 4. For lesions whose apparent thickness suggested that grenz rays would not penetrate sufficiently, a filter of 1 mm. of cellon was added; where the scalp was to be treated 29 kv. with a filter of 0·3 mm. of aluminium was used. With grenz rays the dosage varied from 160 to 200 r. weekly to a total of 880 to 1,840; with 29 kv. the usual dosage was 66 r. weekly to a total from 266 to 1,056 r. These schedules are similar to those used in chronic hyperkeratotic eczema,[3] but slightly higher than those used by Baer and Witten.[4] Nevertheless, I have rarely had to exceed their maximum *annual* recommended dose of 1,600 r. of grenz rays. Simultaneous topical therapy has been limited to an occasional application of soft paraffin at night in hyperkeratotic lesions, and the regular use of a shampoo in cases where the scalp was involved.

### RESULTS

Immediate results have been most gratifying and only one lesion—on the elbow—has proved refractory to 1,840 r., though lesions on the hands of the same patient cleared with 1,060. Relapses are of course frequent and may begin as soon as 6 weeks after the end of treatment, though in most cases 3-6 months' complete freedom is obtained. I have the impression that relapses occur sooner with the more superficial types of radiation, i.e. soonest after treatment at 10 kv. and latest after 29 kv. One encouraging and unexpected finding is that the response to second and subsequent courses of grenz-ray therapy is more rapid than to the original course, so that fewer treatments are needed with each course and the intervals of freedom are longer. Thus one patient needed 1,525 r. at 10 kv. to clear the elbows in February 1957. He reported an early recurrence in June 1957, which cleared after 675 r. The second recurrence in November 1957 was treated at 14·5 kv. and responded to 830 r; there was then a period of 10 months' complete freedom followed by a relapse, which responded rapidly to 660 r. He has therefore received a total of 3,690 r. to the elbows in just under 2 years.

No unwanted sequelae have been seen in the admittedly short period of 3 years during which I have used this treatment, and I have the feeling that it is possible in most cases to continue suppressing the more noticeable manifestations of psoriasis without incurring the risk of such sequelae. Thus a statement recently made,[5] 'There is nothing a dermatologist can do with grenz rays that a radiologist cannot do with X-rays', does not apply, *inter alia*, to the treatment of psoriasis, for I think most radiologists would hesitate to use X-rays generated at 70 kv. or more, in effective doses, to the same area of skin, repeated as often as is permissible with grenz rays.

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## PORPHYRIN METABOLISM IN THE BANTU*

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A sensitive, reliable, qualitative test for porphyrin in urine was described. Coproporphyrin was extracted quantitatively by using this test, but the extraction of uroporphyrin was incomplete, giving results for the amount present in urine lower than the true value.

As this method is much more sensitive than the usual qualitative methods in use, and since significant amounts of uroporphyrin are probably only excreted by patients with porphyria and extensive liver damage, it should be of great value for use in surveys.

A survey of 4,800 urine specimens from normal and hospitalized (non-porphyric) European, Bantu and Coloured individuals showed positive reaction in 61% of Bantu, 48% of Coloured and 18% of European specimens. The increased excretion of porphyrin in the Bantu is probably caused by impaired liver function; good correlation was found between porphyrin excretion in the urine and liver function tests. When urinary porphyrin was increased, faecal porphyrin was decreased—a finding which also points to impaired liver function.

In nearly all the Bantu cases with increased porphyrin the increase was due to coproporphyrin; in these cases urobilinogen in the urine was also increased. However, a few patients with liver damage were found to excrete uroporphyrin in addition to coproporphyrin in amounts nearly comparable to those found in porphyria. In these cases urobilinogen in the urine did not parallel porphyrin excretion. Whether such Bantu patients are latent porphyrics is not known at present.

* Summary of a talk given at a Staff Meeting of the South African Institute for Medical Research, Johannesburg, on 25 May 1959.

## UNIVERSITY NEWS : UNIVERSITEITSNUUS

### SPECIAL GESTURE TO PROF. E. C. CRICHTON

A small committee consisting of Dr. R. G. Sharp, Mr. J. S. Marr, Prof. J. T. Louw, and Mr. J. D. Joubert, contacted Prof. E. C. Crighton's house surgeons with the object of collecting a sum of money to commission two portraits of 'Eric'. About 100 doctors all over the world were thus contacted, and Miss Laurel Zahn (now Mrs. John Goodwin) painted two beautiful portraits of Professor Crichton.

A cocktail party was held in the Obstetrics Lecture Theatre, Medical School, University of Cape Town, at which the wife of the principal of the University, Mrs. J. P. Duminy, presented one of the portraits to the Medical School and the other to Professor Crichton. The Principal of the University of Cape Town, Prof. J. P. Duminy; Prof. B. Bromilow Downing, Dean of the Faculty of Medicine; ex-professors of the medical school; members of the teaching staff; and many of Professor Crichton's old house surgeons and other colleagues were present on this occasion.

Among the speeches made at this party was Mr. Joubert's, in which he explained the purpose of the gathering, and Professor

Duminy's which referred to Professor Crichton's achievements and his remarkable qualities as a teacher. Professor Louw recalled some of the personal incidents that have endeared Professor Crichton so much to all his students. In his reply, Professor Crichton thanked all those present and those who had contributed to the fund. He also expressed the desire to write and personally thank all those who had contributed.

The Committee still has some funds in hand, and with the consent of the contributors this balance will, when all expenses have been deducted, be paid to the Benevolent Fund of the Medical Association of South Africa.

All who are interested are invited to inspect the busts of Professor Saint, the late Professors Falconer and van den Ende, and now the portrait of Professor Crichton, in the Medical School, University of Cape Town.

## PHARMACEUTICAL NEWS : FARMASEUTIESE NUUS

### FBA PHARMACEUTICALS (S.A.) (PTY.) LTD.

Channel Drugs (Pty.) Ltd., distributors for the last 4 years of the ethical pharmaceutical products made by Farbenfabriken Bayer Ag, referred to shortly as FBA, has changed the company name to FBA Pharmaceuticals (S.A.) (Pty.) Ltd. The Company has been reconstructed on a larger and wider basis and will market not only many of the ethical products and pharmaceutical chemicals developed in the well-known FBA-Laboratories at Leverkusen and Elberfeld in Germany, but will also be responsible for manufacturing a number of these specialities locally. A programme of intensive advertising and medical representation is being started.

Many members of the pharmaceutical profession will recall the important discoveries of the FBA-Laboratories which include that of phenacetin, aspirin and phenobarbitone. This was followed in 1931 by the introduction of hexobarbitone sodium, the first intravenous anaesthetic, in 1932 by the first sulphonamide for medical use, and in 1936 by aneurine hydrochloride.

Major contributions in the field of anti-malarial therapy began with the discovery in 1930 of mepacrine and culminated in chloroquine, marketed in South Africa under the trade name Resochin.

The introduction of thiosemicarbazone (Conteben) led to a new approach in tuberculostatic chemicals, which resulted in the discovery of isoniazid (Neoteben) in 1951.

The present emphasis on FBA-research is illustrated by the fact that 1,600 scientists are working on development, testing and production. Last year nearly 7 million pounds were spent on research in all branches of the Company's activities, including synthetic fibres, plastics and plant-protection products. Apart from resulting in new and more effective pharmaceuticals, this work will contribute to scientific progress as a whole.

## PASSING EVENTS : IN DIE VERBYGAAN

*Victoria Hospital, Wynberg, Cape.* The honorary staff of this hospital will hold a meeting in the Nurses' Home on Tuesday 18 August at 8.15 p.m. Dr. R. Turner will discuss 'Medico-legal aspects of alcoholism'. All practitioners are cordially invited to attend this meeting.

* * *

*South African Institute for Medical Research.* A staff scientific meeting will be held in the Institute Lecture Theatre on 24 August at 5.10 p.m. Dr. R. E. Bernstein will talk on 'Some reflections on current views of renal function and the basis of the newer diuretics'. Tea will be served and visitors will be welcome.

* * *

*University of the Witwatersrand, Medical Graduates Association.* Will members please note that the Seventh Alumni Dinner of this Association, which will be held in honour of the classes of 1935 and 1936, will take place on Wednesday 16 September, in Johannesburg. Further details will be published in a later number of this *Journal.*

* * *

*Lede word daaraan herinner* dat hulle die Sekretaris van die Mediese Vereniging van Suid-Afrika, Posbus 643, Kaapstad, sowel as die Registrateur van die Suid-Afrikaanse Geneeskundige- en Tandheelkundige Raad, Posbus 205, Pretoria, moet verwittig van enige adresverandering. Versuim hiervan beteken dat die *Tydskrif* nie afgelewer kan word nie. Dit het betrekking op lede wat oorsee gaan sowel as dié wat binne die Unie van adres verander.

* * *

*Research Forum, University of Cape Town.* A meeting of Research Forum will be held on Tuesday 18 August at 12 noon in the Bennie de Wet Lecture Theatre, A-floor, Groote Schuur Hospital, Observatory, Cape. Dr. Barney Kaplan will speak on 'Malnutrition, pre-pellagra and kwashiorkor with special emphasis on clinical signs in various communities'. All who are interested are invited to attend this meeting.

* * *

*South African Orthopaedic Association (M.A.S.A.), Cape Town Sub-group.* This Sub-group will hold a clinical meeting in the E-floor lecture theatre, Groote Schuur Hospital, Observatory, Cape, on 19 August at 8.15 p.m. All interested practitioners are invited to attend.

On 24 September Dr. Rex Diveley, of the Dickson-Diveley Clinic, Kansas City, USA, will address this Sub-group on the 'Treatment of the painful hip' in the E-floor lecture theatre, Groote Schuur Hospital, at 8.15 p.m.

* * *

*Dr. David Davies*, Cecil John Adams Fellow for 1958, has recently returned to Cape Town after visiting the USA and the UK. During his absence Dr. Davis visited many of the major plastic surgery centres in these countries and attended the Cleft Palate Congress in Philadelphia, the Annual Congress of the American Society of Plastic Surgeons in Boston, and the International Congress of Plastic Surgeons in London. Dr. Davies has now resumed practice as a plastic surgeon at 805 Medical Centre, Heerengracht, Cape Town. Telephone 3-0392.

*Dr. David Davies*, Cecil John Adams Genoot vir 1958, het onlangs na Kaapstad teruggekeer na 'n besoek aan die V.S.A. en die Verenigde Koninkryk. Gedurende sy afwesigheid het dr. Davies baie van die groot sentrums vir plastiese snykunde in hierdie lande besoek, en hy het ook die Kongres oor Gesplete Verhemelte in Philadelphia, die Jaarlikse Kongres van die Amerikaanse Vereniging van Plastiese Chirurge in Boston, en die Internasionale Kongres van Plastiese Chirurge in Londen bygewoon. Dr. Davies het nou weer sy praktyk as plastiese chirurg hervat te Mediese Sentrum 805, Heerengracht, Kaapstad. Telefoon 3-0392.

## NEW PREPARATIONS AND APPLIANCES : NUWE PREPARATE EN TOESTELLE

### SOLPHYLLEX COUGH SYRUP

In introducing Solphyllex, a pleasantly flavoured cough syrup, M. L. Laboratories (Pty.) Ltd., supply the following information:

Solphyllex is a combination of two efficient bronchodilators (hydroxyllin* and theophylline), an effective non-sedative antihistamine (diphenylpyraline), and two expectorants (ammonium chloride and sodium citrate) in an alco-aqueous base, for the rapid absorption of medicaments.

A single dose of Solphyllex produces an almost immediate

effect and relieves bronchospasm. Solphyllex is an ideal combination for the prompt relief of coughs associated with acute or chronic respiratory infections, allergy and asthma.

Solphyllex is well tolerated by patients of all ages and does not cause sedation, respiratory depression, or gastric upset. Being non-narcotic and non-addictive Solphyllex can be used for prolonged therapy.

Each fluid ounce of Solphyllex contains: Theophylline (100 mg.), hydroxyllin* (10 mg.), diphenylpyraline hydrochloride (8 mg.), ammonium chloride (720 mg.), sodium citrate (300 gm.), ethyl alcohol (6 c.c.), and flavour and colouring (q.s.).

*Dosage.* Adults: 1-2 desertspoonsful 3 times daily after meals and at night.

Children: 1-2 teaspoonsful after meals and at night.

Infants: ½-1 teaspoonful after meals and at night.

Solphyllex is supplied in bottles of 4 and 16 fluid ounces.

Literature and samples are obtainable from the South African Distributors, Westdene Products (Pty.) Ltd., P.O. Box 7710, Johannesburg.

* Registered Trade Mark for 1,3-dimethyl-7-(β-hydroxyethyl)-2,6-dioxopurine.

## BOOK REVIEWS : BOEKBESPREKINGS

### SUSPENSION THERAPY

*Suspension Therapy in Rehabilitation.* By Margaret Hollis, M.C.S.P. and Margaret H. S. Roper, M.C.S.P. Pp. xii+220. 112 figures. 25s. net. London: Baillière, Tindall and Cox Ltd. 1958.

'Suspension Therapy' is a fitting tribute to Mrs. Guthrie Smith, edited and presented by Margaret Hollis and Margaret H. S. Roper. As in Mrs. Guthrie Smith's book, the diagrams and illustrations are excellently portrayed. The book brings up to date the art and technique of this therapy as applied under present-day conditions. The articles are very enlightening, in particular the one dealing with amputations. This book is ideal for the student and the practitioner of suspension therapy.

T.P.H.

### FRACTURES AND DISLOCATIONS

*Fractures and Dislocations.* By George Perkins, *M.C.*, M.Ch., F.R.C.S. Pp. viii+363. 255 figures. 57s. 6d. London: University of London, The Athlone Press. 1958.

This book has obviously been written primarily for the medical student and general practitioner. No details concerning operative procedures have been included. A system of starring each fracture has been employed. This means that the practitioner can see at a glance which fractures he can safely handle himself. The author in many instances stresses early movement or ambulation, often adopting a rather radical approach. Splintage and immobilization are reduced to a minimum. For example, in transverse fractures of the shaft of the femur, skeletal traction without any additional splint is the method of treatment advocated. It is to be regretted that in a book of this nature the more conservative skin traction with the Thomas splint is not mentioned at all. The Thomas splint is recommended as a first-aid measure only.

The book is well written and the illustrations are excellent. Amusing remarks find their way into the text—for example in the section dealing with elbow injuries in children, the author writes: 'The child is advised to avoid activities that are likely to cause another fall, such as trick-cycling, horse riding, and skating. The advice won't be taken'.

G.D.

### OPERATIVE TREATMENT OF CARDIAC DISEASE

*Operable Herzleiden.* Einführung in Klinik, Diagnostik und Operationsmöglichkeiten. Von Prof. Dr. J. Jacobi und Prof. Dr. M. Loeweneck. Unter Mitarbeit von Dr. K. Maier und Dr. H. Samlert. viii+175 Seiten. 155 Abbildungen in 268 Einzeldarstellungen. DM 49.50. Stuttgart: Georg Thieme Verlag. 1958.

The authors devote at least one chapter to the history of cardiac abnormalities and the ensuing special investigations. They have not forgotten to pay tribute to the great pioneers of the past—especially those who rendered valuable contributions before the advent of the modern (not to say ultra-modern) laboratory. In subsequent chapters they attempt a classification of cardiac abnormalities and anomalies with special reference to those causing incapacitating disorders. For the rest, the treatise is based on a method of diagnosis with reference to the various operative possibilities which exist, with special attention to the congenital cardiac aberrations amenable to surgery. Cardiac catheterization is mentioned as a vital aid in diagnosis. The authors also pay tribute to the heart-lung machine; the basic principles, uses, failures and successes are set out.

D.J.H.

### MEDICAL TECHNOLOGY

*A Primer in Medical Technology.* By Paul M. Kraemer. Pp. viii+338. 33 figures. 58s. 6d. Oxford: Blackwell Scientific Publications. 1958.

As mentioned by the author in the preface, the scope of this book is limited, no mention being made of bacteriological, parasitological or histological techniques.

However, it can be said of the subject matter dealt with, that it is treated in a novel and refreshing manner, providing an excellent background to, and understanding of, laboratory methods. The anatomical and physiological aspects of the renal system and the laboratory tests used to determine abnormalities are simply and lucidly explained. The other chapters, on haematology, blood chemistry and cerebrospinal fluid, are also very well presented. The book has a decided value for the medical technologist embarking on his or her profession.

S.J.R.

### ORBITAL DISEASES OF NASAL ORIGIN

*Die rhinogenen Erkrankungen der Orbita.* Von Dr. R. Herrmann. viii+83 Seiten. 42 Abbildungen. DM 18.00. Stuttgart: Georg Thieme Verlag. 1958.

This book deals with orbital complications of nasal and sinus disease. The subject falls in the border-line between rhinology and ophthalmology and should thus be of interest to specialists in both these branches of surgery. Many articles have been written on the subject and this volume fulfils a much needed want in collecting the cumulative experience of many investigations in one book of 80 pages. The work is profusely illustrated with fine photographs and simple but clear diagrams of every possible orbital complication of rhinogenous disease. Much can be learned from detailed study of the illustrations alone. The book can be unreservedly recommended.

B.T.B.

### THE PHYSIOLOGICAL BASIS OF SURGERY

*Pathophysiologische Grundlagen der Chirurgie.* Von Priv.-Doz. Dr. Th.-O. Lindenschmidt. xx+410 Seiten. 40 Abbildungen. Ganzleinen DM 56.00. Stuttgart: Georg Thieme Verlag. 1958.

The author outlines the patho-physiological basis of surgery. He mentions disturbances of protein, carbohydrate and fat metabolism and diseases of many organs. The quality of the various chapters differs. Some parts of the book are good and interesting, but in other ones, apparently, the author has to rely on the medical literature without being sufficiently experienced to decide whether his references are reliable. This field of applied physiology is so large that it can hardly be covered by a single person's work; future editions of this book should be written in collaboration with other specialists.

H.W.W.

### LOVE AND LIFE

*A Woman Doctor Looks at Love and Life.* By Marion Hilliard. Pp. 190. 8s. 6d. net. London: Macmillan & Co. Ltd. 1958.

Dr. Marion Hilliard has written a very important little book of 170 pages of easy reading. It contains the experiences and shrewd

observations of 25 years of work amongst people during their times of stress and difficulty. This insight into the frailties of human beings is presented with such wisdom and humility and with such scintillating wit that she offends nobody, however shocked one feels at first to find one's innermost and well-hidden, thoughts exposed to the sunlight. There is a chapter and a message for averyone—man, woman and adolescent—and in my opinion the book is a treasure and a 'must'.

R.K.

## TROPICAL PAEDIATRICS

*Diseases of Children in the Subtropics and Tropics.* By H. C. Trowell, *O.B.E.*, M.D., F.R.C.P. and D. B. Jelliffe, M.D., M.R.C.P., D.C.H., D.T.M. & H. Pp. xvi+919. Illustrations. 105s. net. London: Edward Arnold (Publishers) Ltd. 1958.

The author's preface states that this book is probably too high-powered for most medical students and is really intended for postgraduate study of the clinical aspects of the diseases described in the title. There are 75 contributors from 24 countries, and the standard of the sections was bound to vary. Some are magnificent, a few are poor. No attempt is made to detail signs and symptoms of diseases of world-wide distribution, which are assumed to be common knowledge to any qualified medical practitioner. Conversely, tropical and subtropical diseases, and especially problems of nutrition, are dealt with in detail. References to recent literature are given. The illustrations, tables, and charts are excellent and the book is a valuable addition to paediatric literature, and cheap by present standards. F.J.F.

## ORTHOPAEDICS IN GENERAL PRACTICE

*Orthopaedics in General Practice.* By W. H. Gervis, M.A., M.B., B.Ch. (Cantab.), F.R.C.S. Pp. x+120. 32 figures. 10s. 6d. net. London: William Heinemann Medical Books Ltd. 1958.

The author, an orthopaedic surgeon, has himself been in general practice. In this book he discusses common painful conditions affecting the human frame from head to foot. His thesis is that most aches and pains are not 'rheumatism' but the result of faulty posture in standing, sitting, walking or lying down; that they are amenable to correction of abnormal postures by appropriate exercises and even by stretching as animals do. There is certainly much truth in all this, but one does not agree with the author where he so much minimizes the occurrence of 'rheumatic affections' of the muscular system. Local infiltrations, such as hardened and extremely sensitive *circumscribed* areas in muscles, especially near their tendinous ends, in the nuchal region, shoulders, back, loins, hips, knees, shins, ankles and even fingers and toes cannot invariably be ascribed to strain *per se*. One sees many headaches due to tender spots in muscles at the back of the head or neck, which, when removed by local treatment, subside forthwith. Examples are legion. One has seen many Native women who walk with a perfect poise complaining of severe bouts of backache.

These matters apart, students would do well to read this little book carefully, paying due attention to the otherwise sound teaching set forth. G.C.A. v.d. W.

## RETICULO-ENDOTHELIAL SYSTEM

*The Reticulo-endothelial System in Growth and Tumour Formation.* By Roger Wyburn-Mason, M.A., M.D. (Cantab.), M.R.C.P. (Lond.). Pp. 206. 79 illustrations. 42s. net. London: Henry Kimpton. 1958.

In this book Dr. Wyburn-Mason records the results of his investigations into the functions of the reticulo-endothelial system, using vital and supravital staining techniques. The first 40 pages are devoted to a detailed account of the distribution of macrophages within normal tissues. This section of the book will prove of value to those seeking information on one or other specific point but the average reader will probably gladly accept the author's own suggestion that he reads the summary at the end of the chapter rather than the lengthy account itself. The functions of the RE cells are then examined and the author attributes to these cells a far more fundamental role in metabolism and growth than is generally thought. As a result of his studies he has developed some interesting and stimulating ideas on the fundamental nature of malignant tumours. His ideas are controversial but anyone interested in the more basic aspects of tumour growth will find much food for thought in the latter half of this book.

M.I.S.

## COFFEE CONTRA-INDICATED

*Coffee and Caffeine.* By Dr. Med. Rolf. Ulrich. Pp. 52. 7s. 6d. Bristol: John Wright & Sons Ltd. 1958.

The author of this little book felt it necessary to collect information on coffee and caffeine scattered in the literature and present a balanced account of current knowledge on the subject. The literature is entirely continental, and certain words and phrases used in the translation give a continental flavour. The author forbids the consumption of full coffee in certain heart diseases, high blood pressure, inflammatory eczema, certain cases of pulmonary tuberculosis, hyperthyroidism, gastric and duodenal ulcers, chronic inflammatory states of the bladder, kidney diseases, and glaucoma. Not everybody will accept these views. The author does not refer to the symposium on tea at the New York Academy of Sciences, 16 May 1955 (published by The Biological Sciences Foundation, Washington), where it was agreed that there are no medical contra-indications to the drinking of that beverage; but he cites work from Utrecht indicating that tea is the most harmless caffeine-containing drink, which is attributed to inhibition of its caffeine content by adenines. N.S.

## CARDIAC FAILURE

*Die Herzinsuffizienz in der Praxis.* Von Dr. Dr. K. Bloch. viii+216 Seiten. 8 Abbildungen. Kartoniert DM 19.80. Stuttgart: Georg Thieme Verlag. 1958.

By way of introduction much space and time are devoted to an explanation of myocardial contraction and changes which ensue during contraction. The accumulator system is discussed. This is also thought to be the explanation of the ability of the heart to perform with such perfect synchronicity the functions demanded by the body under different forms of physiological and pathological stresses. Equal emphasis is laid on histology, chemistry and neurological innervation.

The methods and drugs employed in the treatment of cardiac failure are taken in review by the authors and certain recommendations are offered with special reference to cardiac failure in infants, e.g. the use of intravenous strophanthin, which he considers should be avoided. Digitoxin is the drug of choice according to his own experience. J.J.H.

## A PRIMER OF ANAESTHESIA

*Narkose-Fibel* für klinische und ambulante operative Eingriffe. Von Dr. H. J. Thum. viii+103 Seiten. 10 Abbildungen. Kartoniert DM. 13.50. Stuttgart: Georg Thieme Verlag. 1958.

This treatise, based on years of experience, offers useful hints as regards corrective treatment in emergency. The author, without probing far into detail, explains the principles of anaesthesia and the different methods of application, with special reference to physical conditions affecting the routine administration of gases. He describes the different stages of anaesthesia. Comments are made on the use of atropine in cases presenting with tachycardia, as in thyrotoxicosis or related diseases.

The author gives some useful advice concerning anaesthesia during the different stages of pregnancy and in Caesarean section; he considers the administration of barbiturates to be contra-indicated. J.J.H.

## CLINICAL CHEMISTRY

*Clinical Chemistry in Practical Medicine.* 5th edition. By C. P. Stewart, D.Sc. (Dunelm.), Ph.D. (Edin.) and D. M. Dunlop, B.A. (Oxon.), M.D., F.R.C.P. (Edin.), F.R.C.P. (Lond.). Pp. vii+342. 30 figures. 27s. 6d. net + 1s. 7d. postage abroad. Edinburgh and London: E. & S. Livingstone Ltd. 1958.

The present edition is augmented and rewritten in part. Intended primarily for students in medicine, there can be no doubt that this book is one of the best available for this purpose. However, its scope is not limited to students only; the practitioner, houseman and registrar have in it a valuable guide to the intelligent use of clinical chemistry. In a lucidly written book, clinical chemistry is placed in its correct perspective. Despite the concise appearance

of the volume, it is remarkably comprehensive and the reader will find that it covers almost every aspect of present-day clinical chemistry. In short, it is difficult to overstate the value of this book to those who strive to maintain adequate standards in the use of clinical chemistry in relation to the practice of medicine.

S.M.J.

### ADVANCES IN PAEDIATRICS

*Advances in Pediatrics*. Vol. X. Editor: S. Z. Levine. Pp. 362. Illustrations. $9.00. Chicago: Year Book Publishers, Inc. 1958.

The high standard set by contributors to previous volumes in this series has been maintained. In this tenth volume there are excellent and useful reviews of 'convulsive disorders', 'the treatment of tuberculosis', and 'the prevention of poliomyelitis by vaccination'. The chapter on 'psychologic principles in pediatric practice' not only reviews the psychological effects of acute illness but industriously details the implications of numerous specific chronic illnesses. Reflecting a lack of major new advances in the paediatric field despite active clinical research, it is disappointing to find so little fresh material in this volume. There is a short chapter on 'muscular disorders' and a very interesting one on the 'transfer of antibodies from mother to offspring'. The chapter on 'staphylococcal infections in nurseries' is timely and important and should be read by everyone who has duties on a maternity unit.

L.S.

### DIFFERENTIAL DIAGNOSIS OF NEUROLOGICAL DISORDERS

*Differentialdiagnose neurologischer Krankheitsbilder*. Von Prof. Dr. Dr. G. Bodechtel. xxviii+975 Seiten. 532 Abbildungen in 638 Einzeldarstellungen. Ganzleinen DM 120.00. Stuttgart: Georg Thieme Verlag. 1958.

This book stresses the clinical picture as the important point in dealing with problems of differential diagnosis in neurological diseases. The diseases of the peripheral nervous system are dealt with in the first chapter. The second chapter deals with the diseases of the brain and spinal cord—circulatory disturbances, inflammation, tumours and congenital abnormalities. It is shown that a painstaking history and careful clinical examination suffice in most cases to arrive at the correct diagnosis. That is why the technical examinations are dealt with only briefly. The contents are based on the rich experience of a medical clinic, and the book is very detailed, with excellent illustrations. It should be of great interest to the neurologist and the physician, but also to all other members of the medical profession.

H.L. de V.H.

### THE PREMATURE INFANT

*Care of the Premature Infant*. By Evelyn C. Lundeen, R.N. and Ralph H. Kunstadter, M.D., F.A.C.P., F.A.A.P. Pp. xv+367. 87 illustrations. 60s. net. London: Pitman Medical Publishing Co. Ltd. 1958.

This book is written by a nurse and a paediatrician, both closely associated with the late Dr. Julian Hess, whose book *The Premature Infant* is so well known to workers in this field. Although the present work is based on the previous book by Dr. Hess, it has been completely revised and bears little resemblance to it. The nursing and medical care of the premature infant as practised at the Michael Reese Hospital in Chicago is the basis of this book, and this alone should recommend it to all those caring for the premature baby.

There are some rather debatable features, such as the author's recommendations on the calorific requirements of infants—isn't 60-90 calories per kg. body-weight per day rather low? Their recommendations on the indications for oxygen therapy in the premature infant appear to the reviewer to be too liberal but they do rightly stress the need for not exceeding the 40% oxygen concentration in preventing the tragic occurrences of retrolental fibroplasia; and also the need for control of oxygen concentrations in premature care by having available an oxygen analyser to regularly record these concentrations.

This book is certainly recommended to those working in this field of neonatal paediatrics.

I.K.

## CORRESPONDENCE : BRIEWERUBRIEK

### MEDICAL ART EXHIBITIONS

*To the Editor:* The doctor's art exhibition[1] this year sparked off a good deal of controversy on whether—in fairness to the professional artist—doctors should exhibit their work.

As the widow of a well-known South African professional artist, Albert E. Mason, and the mother of a local professional artist, I suggest that doctors continue holding their annual exhibition, but that no works exhibited be for sale. In this way their exhibition would in no way affect the livelihood of the professional artist. Doctors should have the opportunity of exhibiting. How otherwise would the gifted amateur among them be recognized?

Once in a while a doctor becomes a well-known or even a famous professional artist—as in the case of Eric Kennington. Many of his famous portraits are reproduced in the books of Lawrence of Arabia. Henry Tonks was once a surgeon—many of his works are in world-renowned art galleries.

c/o Barclays Bank, D.C.O. Florence Mason
Adderley Street
Cape Town
24 July 1959

1. Passing Events (1959): S. Afr. Med. J., 33, 345 (18 April).

[At the art exhibition referred to in this letter the items exhibited were not offered for sale to the public—*Editor.*]

### JUVENILE SCHIZOPHRENIA

*To the Editor:* Dr. Lowenstein's article[1] on juvenile schizophrenia in the Bantu has prompted us to recall the following cases. They have been seen among 270 male Bantu admissions within the last 2½ years.

1. T.L., Xhosa, 13 years old. He was admitted in June 1957 in catatonic stupor and was emaciated. Within 6 months he recovered without any specific treatment and was discharged. In October 1958 he was re-admitted and is still in hospital. Electroconvulsive and ectonustim treatments were administered with only mild improvement in his condition. Currently he is obese and hebephrenic.

2. K.G., Xhosa, 16 years old. He was admitted in December 1958 for observation after being charged with murder. He was initially diagnosed as an imbecile with malnutrition, especially pellagra, but after his history had been obtained and he had been observed for several months, the diagnosis was changed to hebephrenic schizophrenia. He was given ectonustim with some improvement. Currently he is very obese and his physique resembles that of the female adolescent.

3. L.M., Xhosa, is interesting because although he was 18 years old when admitted in December 1957 in catatonic stupor, his physical development was that of a boy of 11 years. He had a receding forehead, marked gynaecomastia, no pubic hair and small undeveloped genitalia. His psychosis was of 3 months duration. He received electroconvulsive treatment and was discharged recovered after 3 months. He has remained well since then.

W. J. Blignault
M. B. Merlin
Komani Hospital
Queenstown
23 July 1959

1. Lowenstein, H. (1959): S. Afr. Med. J., 33, 449.

### STERILIZATION FOR SEXUAL OFFENCES

*To the Editor:* Dr. E. B. Strauss,[1] of St. Bartholomew's Hospital, London, recently observed that fanatical psychogeneticists, best represented, perhaps, by the psychoanalysts, regard all the ills 'that flesh is heir to' as psychically determined. Similarly, some equally rigid exponents of physical methods of treatment in psychiatry favour a psychology and a psychiatry which is without a psyche. It appears to me that this latter group has now gained

a South African adherent.[2] Like the Russians (who abolished the psychoneuroses overnight with a stroke of the pen by declaring that these disorders are a by-product of an unjust economic system and that patients who mistakenly continue to suffer from them under the new dispensation are guilty of bourgeois deviationism), Dr. Steenkamp would have us believe that 'psychopaths . . . might be useful members of society provided they were protected (*sic*) against their criminal tendencies'. This 'protection' is, allegedly, quite simply bestowed by 'either sterilization or castration'.

The first alternative, known as punitive sterilization, seems clearly to encourage the sex offender in his crime rather than to deter him. Is then the somewhat novel alternative of castration the solution to sexual offences? I think not. I think that the sources of the sex hormones in the suprarenal glands and pituitary would, in time, become significant in the age-group concerned. If, at a time when most civilized people are thinking of abolishing the death penalty, we must add mutilation to canings, hangings and other manifestations of our legalized but 'grisly dance of death', it seems to me more pertinent to entertain amputation of the penis, visceral exenteration, or, indeed, trephining of the skull—with hypophysectomy. Even then, however, there will still be at least a hypothalamus to remind the victim of his identity and integrity as a human being.

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20 July 1959

1. Strauss, E. B. in Entralgo P.L. (1955): *Mind and Body: Psychosomatic Pathology*, p. 10. London: Harvill.
2. Correspondence (1959): S. Afr. Med. J., 33, 572.

## DIE KUX-OPERASIE

*Aan die Redakteur:* Na aanleiding van die baie briewe in verband met die sogenaamde Kux-operasie wat gedurende die afgelope tyd verskyn het, en ook omdat ek self pasiënte gehad het wat my oordeel oor die saak gesoek het, het dit vir my verstandig gelyk om te skryf aan 'n bekende van my (prof. dr. H. Deenstra, Hoof van die Afdeling Longsiektes van die Afdeling Interne Medisyne van die Universiteitshospitaal, Utrecht, Holland) met die doel om sy mening oor die saak in te win. Met sy toestemming gee ek hiermee die Afrikaanse vertaling van sy antwoord:

‚Deursnyding van die vagus of enige ander senuwee van die simpatiese senuweestelsel as behandeling van ulkus van die duodenum was 'n tydjie na die oorlog baie in die mode. Op hierdie manier kan sonder enige twyfel dikwels veel bereik word. Die nadele in die vorm van byverskynsels het egter so groot geblyk te wees dat 'n mens die veelvuldige toepassing van hierdie operasie moet afkeur. Baie pasiënte het teruggekom. Daar is nog wel indikasies vir die operasie, veral in die geval van pasiënte wat alreeds 'n reseksie ondergaan het.

Die Kux-operasie behels dus min wat nuut is op hierdie gebied. Ook is hierdie operasie reeds baie toegepas vir die behandeling van asmalyers. Die betekenis van hierdie soort prosedure in gevalle van asma bly egter altyd baie moeilik om te bepaal. Daar is wel sukses bereik in gevalle van asma wat nie op ander metodes van behandeling gereageer het nie. Die moeilikheid skuil egter juis in hierdie laaste sin. Brongiale asma sonder komplikasies wat in die vorm van paroksismale aanvalle voorkom, maar die pasiënt tussenin min of meer normaal laat, kan gewoonlik altyd met sukses behandel word. By hierdie behandeling speel ontspannende asemhalingsoefeninge sowel as die langdurige toediening van kortikosteroïdes in lae dosisse 'n groot rol. Asmatiese brongitis en emfiseem is gewoonlik minder toeganklik vir hierdie soort behandeling. Alhoewel ek nie wil sê dat die Kux-operasie geen waarde het by die behandeling van asma nie, wil ek dit tog stel dat die indikasies vir die Kux-operasie by hierdie gevalle minimaal is. Ons doen nie hierdie operasie in Holland nie.

Die betekenis van die Kux-prosedure is miskien dat hy met 'n torakoskoop werk, en die toraskopiese ingreep in die hande van ervare dokters mag miskien minder risiko en las vir die pasiënt veroorsaak as 'n operasie *via* die oop toraks. Om hierdie rede word voorkeur gegee aan 'n toraktotomie deur 'n borschirurg.

Samevattend sou 'n mens kon sê dat die werk van Kux nie van baie groot betekenis is nie. By enkele swaar getrefde pasiënte, wat nie op 'n ander manier gehelp kan word nie, mag dit wel die moeite werd wees om die simpatiese senuwee en die vagus deur te sny *via* die oop toraks.'

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## RECENT ADVANCES AND NEWER CONCEPTS IN THYROID DISORDERS

*To the Editor:* I should like to thank Dr. Weinbren for his comments[1] on my paper 'Recent Advances and Newer Concepts in Thyroid Disorders'. Since this paper was written as part of the General Practice Series, it was not possible to give full consideration to certain aspects of the problem, and I attempted to give what I considered a fair view of current concepts. One or two points in Dr. Weinbren's letter warrant further discussion.

In my paper I referred to the undesirability of using even trace doses of 131-iodine in children because of fear of carcinogenesis. While I did not cite references, I am amazed that Dr. Weinbren has not come across the fact 'that this possibility has ever been mentioned in the voluminous literature on the subject'. A cursory search has revealed the following statements:

1. '. . . the main body of opinion is now very firmly opposed to the use of 131-iodine for thyroid function studies on young children except in the very few circumstances where there is no alternative'.[2]
2. 'It does not seem justifiable, therefore, to use 131-iodine for diagnostic purposes in children. The same objection does not apply to 132-iodine, since diagnostic tests can be made with very small amounts of this isotope'.[3]
3. 'The risk of the late development of carcinoma in children in particular makes it justifiable only in exceptional circumstances to use radio-active iodine even for test purposes, . . .'.[4]
4. 'Doses apparently sufficient to induce neoplastic change are surprisingly small and may be exceeded in certain diagnostic and therapeutic procedures in childhood'. Certainly, in children the use of 131-iodine is only justifiable in exceptional circumstances.[5] (I was pleased that Dr. Weinbren had chosen to quote Blomfield in support of his view, since this last quotation is taken from a paper written by Blomfield and his colleagues!)

In addition, from personal experience and conversations with others I know that similar opinions are currently taught at the Royal Marsden Hospital, London, and at the Institute of Nuclear Studies, Oak Ridge, Tennessee, USA.

It would seem, therefore, that mention of the possible dangers of using 131-iodine in children is certainly justified. Similar arguments do not necessarily apply to 132-iodine. Incidentally, the latter is very easily obtained in South Africa, since its preparation from 132-tellurium (half-life 77·7 hours) is a simple routine matter, the performance of which is completely justified if it aims at reducing exposure to ionizing radiation.

In pre-adolescent patients, pregnant females, or lactating mothers procedures should be favoured which spare the patient even a theoretical risk. Stable PBI-estimations are extremely useful and, while they require specialized facilities, I made the point in my paper that plasma can be sent to suitably equipped laboratories—a practice widely followed in the USA, where a Californian laboratory performs this test for a vast number of hospitals, extending over to the East coast.

With regard to surgery *versus* radio-active iodine for hyperthyroidism, there are authorities as eminent as Dr. Weinbren who support the view that treatment with 131-iodine should be reserved for those over the age of 45 years, unless there is a distinct contra-indication to surgery.

Our knowledge of the late biological effects of radiation—to the patients or their offspring—is still so incomplete as to justify caution and conservatism. Time alone will tell whether this view is correct or not.

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1. Correspondence (1959): S. Afr. Med. J., 33, 611.
2. Veall, N. and Vetter, H. (1958): *Radioisotope Techniques in Clinical Research and Diagnosis*, p. 313. London: Butterworth and Co.
3. Editorial (1953): Brit. Med. J., 1, 338.
4. *Idem* (1958): *Ibid.*, 2, 962.
5. Wilson, G. M. *et al.* (1958): *Ibid.*, 2, 929.